

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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Flight.

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EDITORIAL COMMENT.

The Progress of the War and the Role of Aircraft. At the time of writing the news from the western theatre of war is not good. Indeed, it is frankly bad, but there is still more than a material hope that the position may yet be retrieved and a decisive victory crown the Allied arms. From the east the news is much better and goes far to balance the temporary check to our armies in Belgium. We can only wait in the sure and confident hope that the gallantry of our own and the French armies will yet succeed in stemming the tide of the German invasion.

Of the details of the fighting we know really very little. The rigid censorship, which has rightly been imposed upon all news from the theatre of war, leaves us entirely in the dark as to what has happened and how, and in consequence of the ban on the presence of war correspondents with the Allied forces in the field, it is quite possible that we may never obtain a really clear story of how the operations of this great war have been conducted. We may, in all probability, have to depend upon the official histories of the war, which are exhaustive but take years to compile and, moreover, largely ignore the more minor issues with which we, as being more particularly interested in the aeronautical side of things, are very greatly concerned.

We know next to nothing of what has been happening in the air, and are thus driven back upon calculation and surmise, which do not carry us very far. As we have

pointed out on previous occasions, the air forces of the opposing nations have gone into this war untried, unknowing what was before them. That whatever they have been required to do has been done to the best of their endeavours we may be quite certain, and it is quite certain that this will apply equally to the Germans as to ourselves and our Allies. We may have our opinions of the morality of this war which Germany has thrust on the world, and we may condemn as barbarous and brutal their methods of carrying it on, but it would be as idle as it would be foolish to assume, or pretend that the German airmen are not likely to display the same energy as our own and the French. The one point at which the latter should be found superior is that the German may be found more lacking in the essential qualities of imagination which count for a good deal in war. On the other hand, we must not forget that although it is probable the outbreak of war found Germany numerically weaker than France in the matter of aeroplanes, and that even of these a certain number must have been detached for the use of the armies defending the eastern frontier, the quality of the machines, if record figures count for anything at all, is rather in front of those possessed by the French army. They thus start with a slight initial advantage to help in counterbalancing their numerical weakness. Nor must it be forgotten that Germany is in at least as favourable a position as France to build machines to fill up the gaps caused by the wastage of war, and to increase her fighting strength in the air. Of course, it would be utterly useless for Germany, or any of the other belligerent Powers, to build machines, unless she already possessed, or could turn out rapidly, the men to efficiently fly them. We know very little which will assist in guiding us to an accurate estimate of the number of trained pilots available for service in the German army on the opening of hostilities, but from what we know of the masterly organisation of German military power, we may be sure that the numbers reached a figure equal to the estimates formed by the General Staff of the requirements of the Field Armies at least. We may be equally certain that the training of pilots to replace those thrown out by casualties is proceeding rapidly, so that it is to be assumed that the German armies now operating on both frontiers are being, and will continue to be, well served by the aerial branch.

And what of the Zeppelins, of which so much was hoped by the Germans? Here again we know very little.

What little we do know, however, would lead us to think that so far they have not by any means justified those hopes. The most these craft appear to have achieved in the four weeks during which the war has existed is the dropping of a few bombs in Antwerp, causing some material damage and killing twelve inoffensive civilians. The other side of the story is that, according to apparently reliable reports, five of these huge vessels have been destroyed. One fell to the guns of the Liège forts on August 6th; another was destroyed by the French aviator, Capt. Finck, near Metz, on the 20th; the very latest craft of the type No. 8 came to grief through French gun-fire between Celle and Badonvillier on the 24th; while two are reported to have been destroyed by a storm. Certainly not an encouraging record! But, at the same time, it will not do to discount the type too heavily, and particularly because we are living in a fog, which allows us only the most transient glimpses of what is happening behind the veil. It may very well be that in directions we know not of the Zeppelins have been doing good work. We hear when one of them has succeeded in dropping bombs into a fortress, but we are not told when it has accomplished useful reconnaissance.

We are even more in the dark so far as reliable information relating to the doings of our side are con-

cerned. Here and there picturesque stories have been told of remarkable feats of French airmen, but hitherto we have not been able to discern through the medium of the official reports that these wonders have really been performed as described. All that we do know is that the French Staff appears to be highly satisfied with the scouting work performed by its air-service, but there is not a word as to its destructive effectiveness.

On the whole, therefore, we may predicate that thus far the lessons of the war tend to confirm the impressions we have recorded on many occasions in these pages—that the true rôle of aircraft in war, in the present stage of their development at least, lies in reconnaissance and not in destructive missions. Later on, and when the tactical dispositions of the hostile armies have been completed and the aeroplanes have finished their initial task, it may be that they will be employed on a different work, but even this, we think is rather doubtful. The more likely hypothesis is that the commanders will prefer to hold them in their hands against the time when they may be required to carry out what we believe to be their proper work of scouting rather than to sacrifice them in operations the effect of which must be much more moral than material. These, so far as we are able to read the very attenuated signs, are the material lessons of the war so far as it has gone up to the present moment.



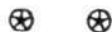
THE ROYAL FLYING CORPS.

THE following appointments were announced in a special supplement to the *London Gazette* issued on the 20th inst. :—

R.F.C.—Military Wing.—*Supplementary to Regular Corps.*—To be Second Lieuts. (on probation): August 12th, 1914: Bentfield C. Hucks, Hon. Edward A. Stonor, Harry S. Keating, Horatio C. Barber, Cecil H. Saunders, Arthur M. Wynne, Thomas F. D. R. Aikman, Edward F. Norris.

The following appointments were announced in the *London Gazette* of the 21st inst. :—

R.F.C.—Military Wing.—*Special Reserve of Officers.*—To be Second Lieuts. (on probation): August 15th, 1914: William H. Charlesworth, Archibald B. Ford, and Edwin L. M. L. Gower. Hon. William F. F. Sempill (Master of Sempill) to be Second Lieut. August 19th, 1914.



Items from the Front.

MANY letters and details of personal interest associated with the aircraft side of the war are, without doubt, now beginning to filter through from the fighting line to friends at home. As any incidents with the touch of local colouring should be of real general interest in a journal like *FLIGHT* we would ask our readers to send along to us any communications of this nature, duly "censored" to the necessary extent, so that they may be published in these pages for the benefit of our many thousands of readers throughout the world.

Messages from Aeroplanes.

THE following notice was issued by the War Office through the Official Press Bureau on the 20th inst. :—

"The attention of the public is called to the possibility of messages being dropped from aeroplanes.

"The messages will be enclosed in a weighted canvas

The following appointments were announced in a special supplement to the *London Gazette*, issued on the 24th inst. :—

R.F.C.—Military Wing.—Officers to be Flying Officers: August 5th, 1914: Second Lieut. Vincent Waterfall, 3rd Batt. East Yorkshire Regt., and to be seconded; Second Lieut. Oswyn G. Lywood, Norfolk Regt., Special Reserve of Officers, Supplementary List.

The following appointments were announced in the *London Gazette* of the 25th inst. :—

R.F.C.—Military Wing.—*Special Reserve of Officers.*—Denys Corbett-Wilson, to be Second Lieut. (on probation). Dated August 19th, 1914.

The undermentioned to be Second Lieuts. (on probation). Dated August 22nd, 1914: William Campbell Adamson, William Barnard Rhodes-Moorhouse, Harry Rowland Fleming, and Hereward de Havilland.



bag, fastened with two spring clips, attached to which are two streamers of blue, red, and yellow cloth, each 4½ ft. long.

"Any person finding or seeing such a bag dropped from an aeroplane should at once open it, and take steps to forward the enclosed message to the person for whom it is intended."

Further British Casualties.

IT was officially announced on Monday that No. 9 Sergeant-Major D. S. Jillings, Royal Flying Corps, was wounded on August 22nd, and was progressing favourably.

It was also officially announced on Tuesday that No. 47 Corporal F. J. P. Geard, Royal Flying Corps, died on August 18th, as the result of an aeroplane accident, while Sec. Lieut. R. R. Smith-Barry, Royal Flying Corps, Special Reserve, sustained severe injuries to leg.

AUGUST 28, 1914.



Salem, Mass., U.S.A., after the great fire which created such fearful devastation there on June 25th. This unique photograph was taken from a Burgess-Dunne seaplane piloted by Clifford Webster. The photograph shows about half of the district which was destroyed by the fire.

FLIGHT

LOST IN THE CLOUDS.

By W. ROWLAND DING.

THE most terrifying experience I have had since I have been flying, and really the most marvellous that any aviator could well have, occurred to me when flying from Bath to Harrogate. Setting out from Bath very early one morning, about five o'clock, and intending to fly straight through to Harrogate without a stop, I found the conditions practically perfect, with the sky beautifully clear, and not a cloud to be seen. Before very many miles had been covered, however, in the distance I saw a little fleecy cloud just making its appearance. It looked quite thin and very innocent indeed, and I thought the best way would be to get over the top of the cloud and continue on my way by the aid of the compass. Having risen over the top of what appeared to be the little cloud, I found that it got larger and larger, the ground being quite hidden from sight; there was simply a beautiful level sea of fleecy white clouds underneath me. I felt quite happy, because the compass appeared to be doing its work, the machine was going well, and the engine running beautifully.

Then the sea of white cloud began to rise gradually, when I naturally pulled up the nose of the aeroplane a

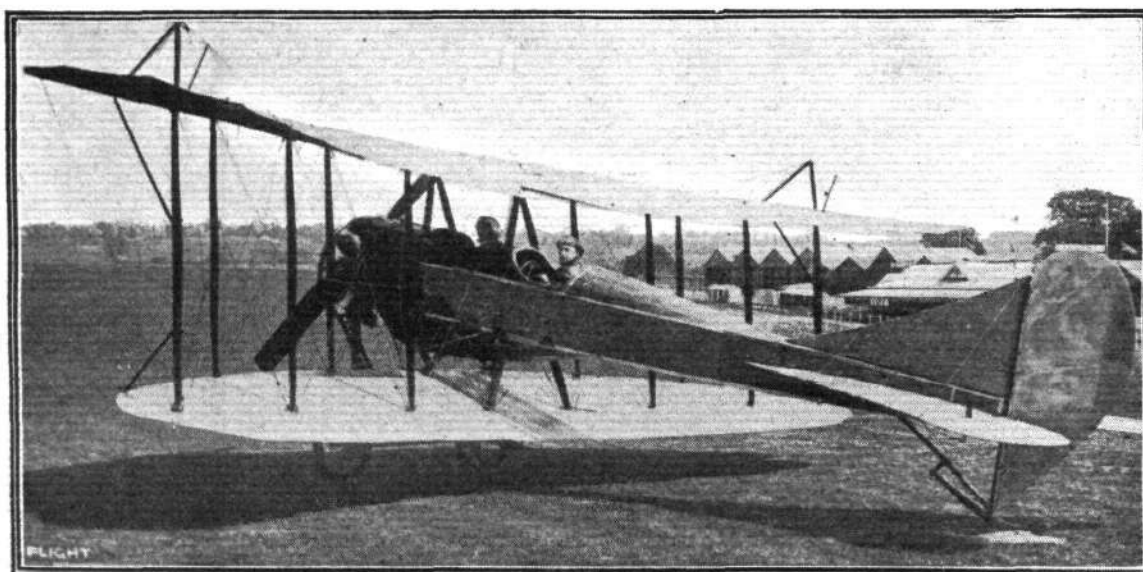
Thus having one cylinder cut off, the machine could not climb quite so rapidly, and as the surface of the cloud itself seemed suddenly to take a very steep ascent, this meant that I had either to come down below it or else continue on straight through the cloud. The extent of the latter being an unknown quantity, I thought the best thing would be to dive down until I was underneath it. Switching the engine off, I started diving down from a height of between 3,000 and 4,000 ft., the cloud getting thicker and thicker until I could not see even the aeroplane itself. In fact, I could only just distinguish the instruments in front of me, about 2 ft. from my face.

Of course I was watching the height recorder very intently and very anxiously, because it was a great surprise to find that the cloud was so deep. I thought I should soon be underneath it and have a clear view of the ground from about 2,000 or 3,000 feet. I went on diving for a long time, until to my horror the height recorder registered nothing, which meant that I must be very near the ground.

As I was unable to see anything at all, I thought the best thing to do would be to make the machine fly as slowly as ever it could. I knew sooner or later I should have to hit something, and so the best thing was to hit it very slowly instead of very fast. For-



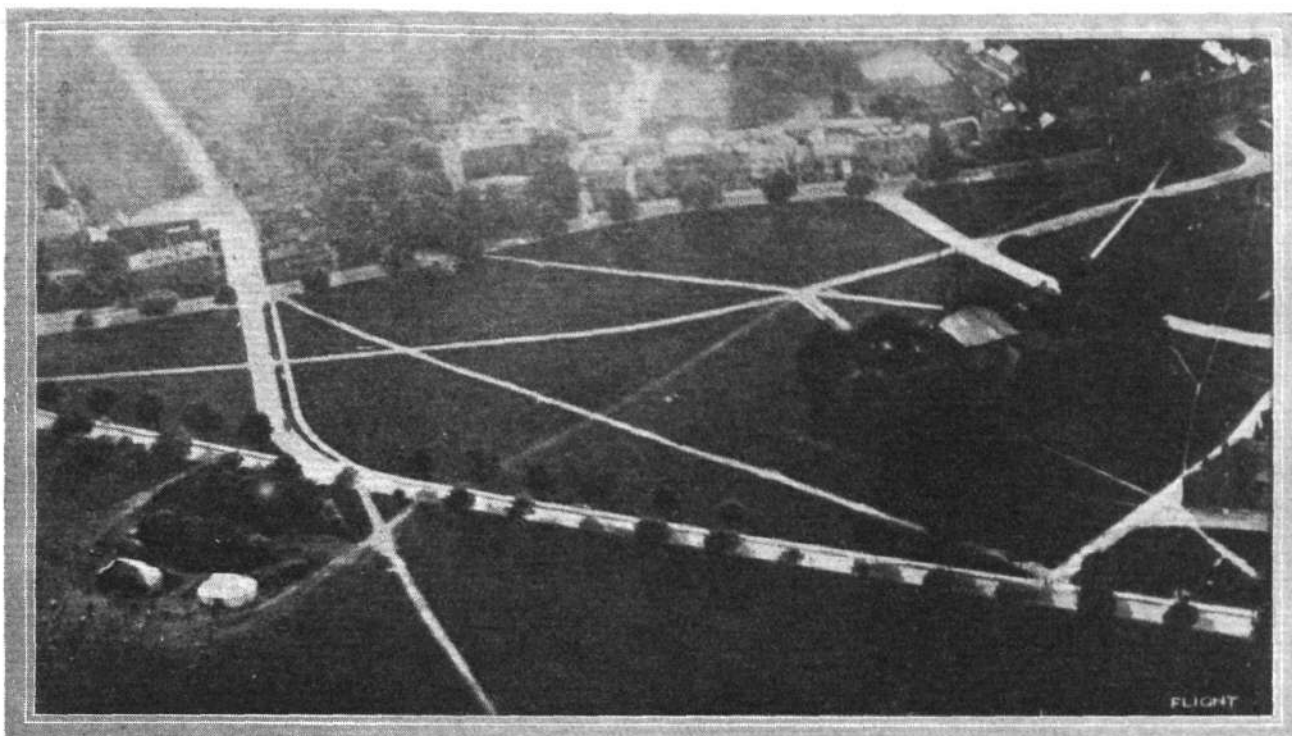
Mr. W. Rowland Ding.



The Handley-Page biplane which Mr. W. Rowland Ding has been flying.

little and climbed up what looked like the side of a big snowy mountain. After keeping on for some time, getting higher and higher, one of the plugs in the engine, probably owing to becoming fouled with oil, mis-fired.

Fortunately the engine I have—the Anzani—throttles down beautifully, and I managed to slow it down till the aeroplane was only travelling at about 35 miles an hour, and with teeth set I continued at this pace until suddenly—



A view of the Stray at Harrogate, showing monoplane tents in the foreground on left, and Christchurch about centre right. Taken from Mr. Rowland Ding's H.-P. biplane from 1,200 ft. The left aeroplane tent is Mr. Ding's and the right-hand one the Blackburn tent.

we hit the ground. Under such conditions a perfect landing could hardly be expected, and it is something to record that there was very little damage done to the aeroplane itself—in fact it was flying again in two days' time. When the fog cleared, giving me an opportunity to take my bearings, I found that I had landed in a barley field, about a mile and a half outside Stroud in Gloucestershire, and the most wonderful part was, that it was the only field for many miles around on which a landing was possible. All round were thick forests and very high hills. I had motored to Stroud a good many times previously, and scoured the whole district round to look for a suitable ground on which to give exhibition



An Australian-built Machine.

A FEW details have been sent along by the General Aviation Contractors, Ltd., regarding the work of Mr. Delfosse Badgery, who it may be recalled is agent for G.A.C. specialties, Anzani motors, Emaillite, &c. in Australia. Since returning to Australia after taking his *brevet* on an Anzani-Caudron at Hendon last January, Mr. Badgery has designed and built a biplane which has proved a very fine flyer. On July 19th, in one of several trials round Sutton Forest and Wollondilly, he went to a height of over 2,000 ft., climbing the first 1,000 ft. in 2 mins. 45 secs. At the first favourable opportunity Mr. Badgery intends to fly from Moss Vale to Sydney, N.S.W. The machine is fitted with a 40-45 h.p. 6-cyl. Anzani, 1914 type, a Rapid propeller, is Emaillite doped, and wherever possible the fittings are British made.

A Badge for U.S. Military Pilots.

In addition to a certificate, officers belonging to the U.S. Army are to receive a military aviator's badge which will become the property of the person to whom it is issued. It will be worn in the manner and on occasions prescribed in general orders.

A New American Record.

On August 6th, at Kansas City, Mo., De Lloyd

flying, but there was never a one to be found, and ultimately I had to give it up as a hopeless job. However, from the above it will be seen that my Handley-Page biplane was more successful and found a ground of its own accord. I may congratulate myself, therefore, upon the very lucky ending to what might easily have been a much more serious, not to say tragic, affair.

W. Rowland Ding



Thompson, on an 80 h.p. Gyro-Day tractor, broke the American height record for pilot alone, by going up to 4,750 metres, or 15,580 ft. The previous record was 11,286 ft., made by Lincoln Beachy in 1911.

Our Photograph of the Salem Fire.

THE photograph which we give on page 893 is unique and gives a graphic picture of what havoc a great conflagration is capable of. It shows about half of the district burned by the fire which swept Salem, Mass., June 25th.

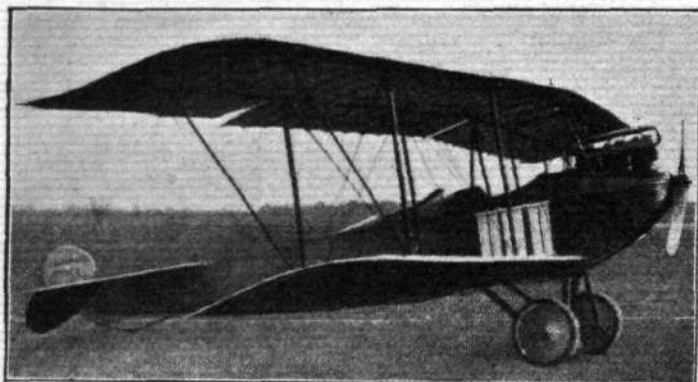
According to *Flying* (U.S.A.), it raged for 15 hours, aided by a high wind, an inadequate water supply, and the flimsy construction of many of the buildings. Over 18,000 people were rendered homeless, and 9,000 are out of work. The property loss is put at \$12,000,000. The picture of the ruins was taken by a photographer on his first aeroplane flight. He walked forward on the *fuselage* and placed his camera outside of the wires, just back of Clifford Webster, the pilot, in some cases, and in others he walked back on the *fuselage* and caught the picture between the engine and the wings. He seemed to be quite at home and went forward and talked to Webster from time to time to indicate where he wanted to go. They rose to a maximum height of about 3,000 ft.

AIRCRAFT "MADE IN GERMANY"

WHICH MAY BE EMPLOYED AGAINST THE ALLIES.

(Continued from page 880.)

7. The Aviatik Tractor Biplane is of the arrow type, although its wings only possess a



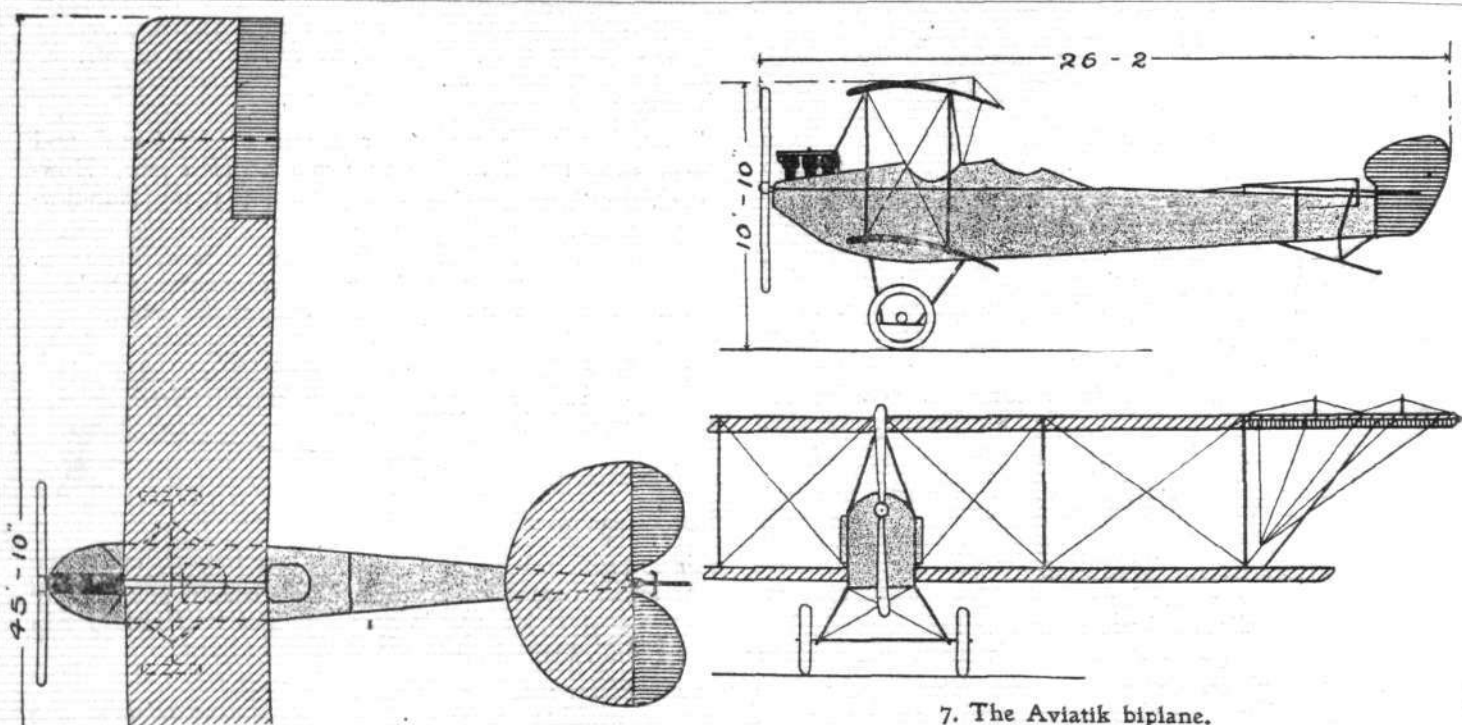
7. The Aviatik biplane.

comparatively slight sweep back. As in other biplanes of this type, the upper main plane is straight as viewed

ground by a short swivelling skid. With full load on board, including pilot and passenger and four hours' fuel, the machine does just over 60 m.p.h., and climbs 1,000 metres (3,281 ft.) in 15 minutes.

8. The New Aviatik Biplane

is, for a German machine, very small and light and of the tractor type. Like the larger machines it is of the Arrow type, having its main planes sloping slightly backward. The upper and lower planes are connected by steel tube struts of streamline section, and a *cabane* of the monoplane type serves as an anchorage for the centre portion of the top plane. The *fuselage*, which is of rectangular section, is more on the lines of English machines, probably on account of the fact that instead of the vertical engine with which German machines are usually fitted, it has a rotary engine—a 114 h.p. Oberursel motor, mounted in the nose of the *fuselage* between double bearers. Pilot and passenger sit one behind the other, the passenger in front. Between him

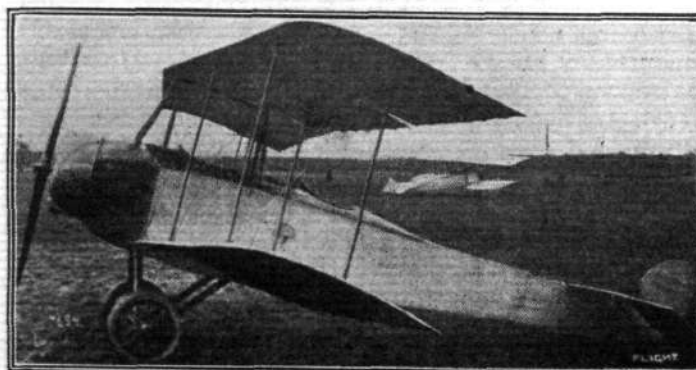


7. The Aviatik biplane.

from in front, while the lower plane is given a slight dihedral angle. The rectangular section *fuselage* is of streamline form, but is deeper at the stern than is usually the case. The turtle back does not extend over the entire length of the *fuselage*, but finishes off just behind the pilot's seat, which is considerably farther forward than in other arrow type machines, owing, no doubt, to the fact that the wings are so nearly straight. In front is the passenger's seat, between which and the engine are the fuel tanks with sufficient fuel for a 4-hours flight.

Either Argus or Mercedes 100 h.p. engines may be fitted. The radiators are mounted on either side of the *fuselage*. The chassis is of the usual simple type, differing, however, from others in that the struts do not form an angle at their lower extremities, but are secured to two short skids from which is slung the tubular axle. The tail planes are protected against contact with the

and the engine are carried, inside the *fuselage*, the petrol and oil tanks. The chassis is of the simple type which

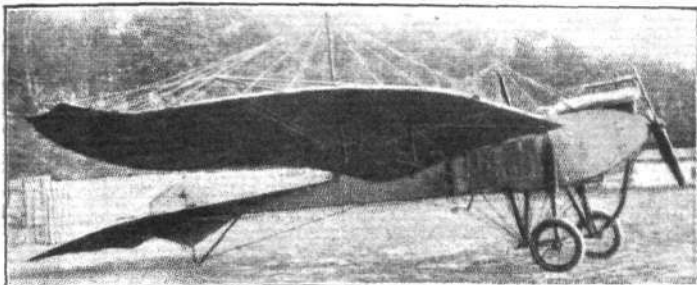


8. The new Aviatik biplane.

has now gained such popularity among German constructors, and consists of two "Vs" of streamline section steel tubes. The axle rests in the angle between the tubes, and is sprung by rubber shock absorbers.

9. The D.F.W. Taube

is modelled on the lines of the Etrich Taube, at any rate as far as the shape and bracing of the wings is concerned. In addition to the usual cable bracing running to steel



9. The D.F.W. Taube.

tube pylons above and beneath the *fuselage* the wings are further strengthened by a girder structure underneath. As these machines are now mostly used for school work, where strength to stand rough usage is of greater importance than low head resistance, this method of construction has much to recommend it, but for actual service they are somewhat slow and cumbersome.

Inside the rectangular section *fuselage* are arranged the two seats, in tandem, the pilot occupying the front one. The tail planes are of the usual Taube type, and consist of a horizontal plane, the front part of which is fixed whilst the rear portion acts as an elevator by being flexed up and down. Small rudders and triangular fins are fitted above and below the tail plane. A single central skid carried on four steel tube struts, of which the rear pair form the lower wing bracing pylon, is bent upwards in front to meet the *fuselage* under the front engine bearer. The wheels are carried on stub axles pivoted on the centre skid, and springing is effected by coil springs on telescopic steel tubes running to the

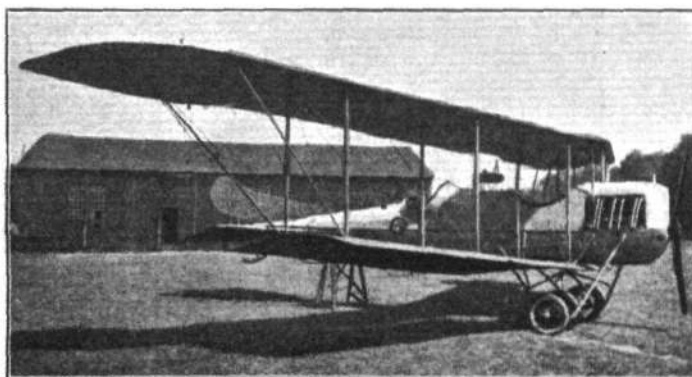
upper *longerons* of the *fuselage*. The radiators are mounted on each side of the body. With a 100 h.p. Mercedes engine the D.F.W. Taube develops a speed of about 68 m.p.h.

10. The D.F.W. Arrow Biplane

is already familiar to our readers from descriptions with scale drawings and sketches which have appeared in our columns. Two machines of this type have been flying at Brooklands for the past year or so, and there is no necessity to go into a detailed description. Suffice it to say that they are steady, reliable machines, if somewhat slow, and as they are built of steel practically throughout they stand up to very rough usage.

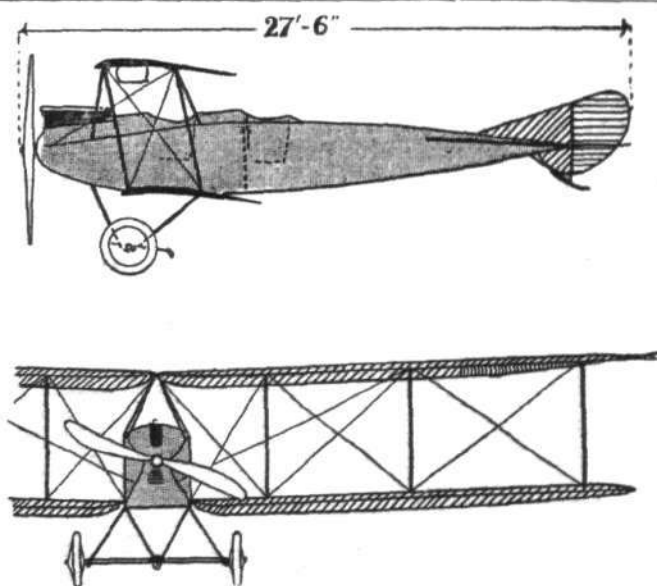
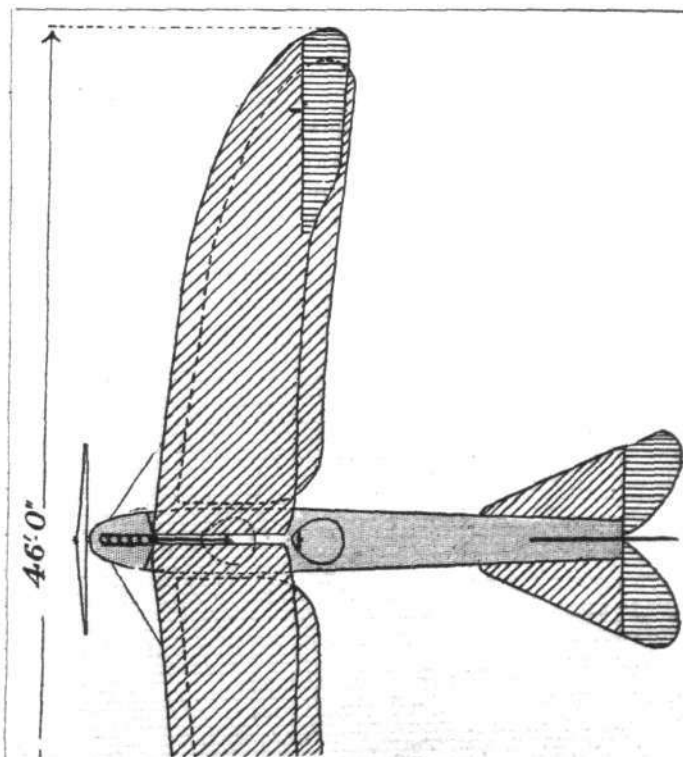
11. The D.F.W. Military Biplane

differs considerably from the previous machine. In its general outline the *fuselage* is somewhat reminiscent of that of the Albatros biplane, with the exception that it tapers to a horizontal knife edge at the rear. Construc-



10. The D.F.W. Arrow biplane.

tionally, it is quite different from the Albatros, however, being built entirely of steel. The struts and cross-members, which are, like the *longerons*, made of steel tubes, are secured to the latter by steel clips and acetylene welding. The cross-bracing wires are secured to these steel clips, and the whole structure is one of great strength.

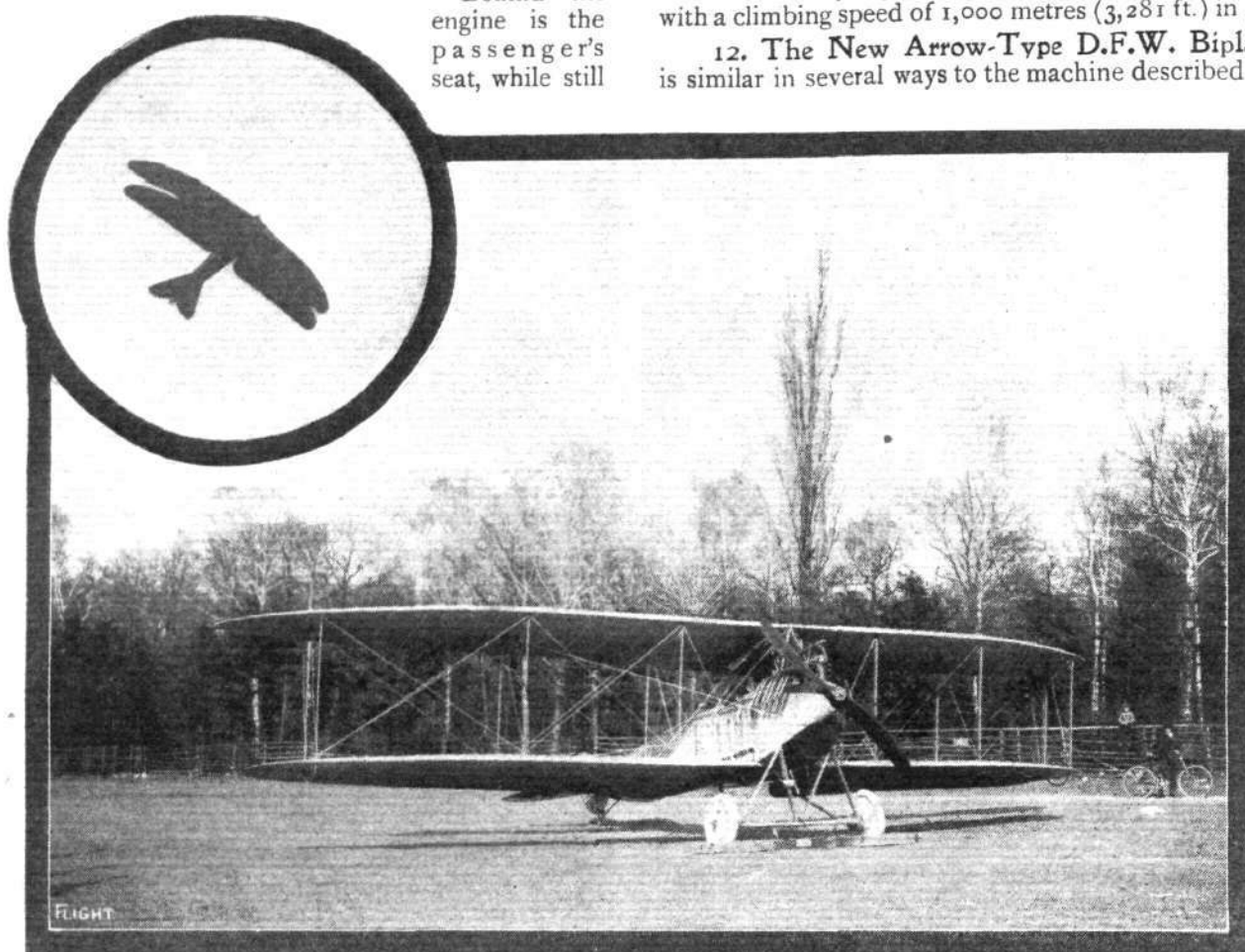


11. The D.F.W. Military biplane.

Behind the engine is the passenger's seat, while still

D.F.W. military biplane is 75 m.p.h., and she is credited with a climbing speed of 1,000 metres (3,281 ft.) in 5 mins.

12. The New Arrow-Type D.F.W. Biplane is similar in several ways to the machine described above,



11. The D.F.W. Military biplane.

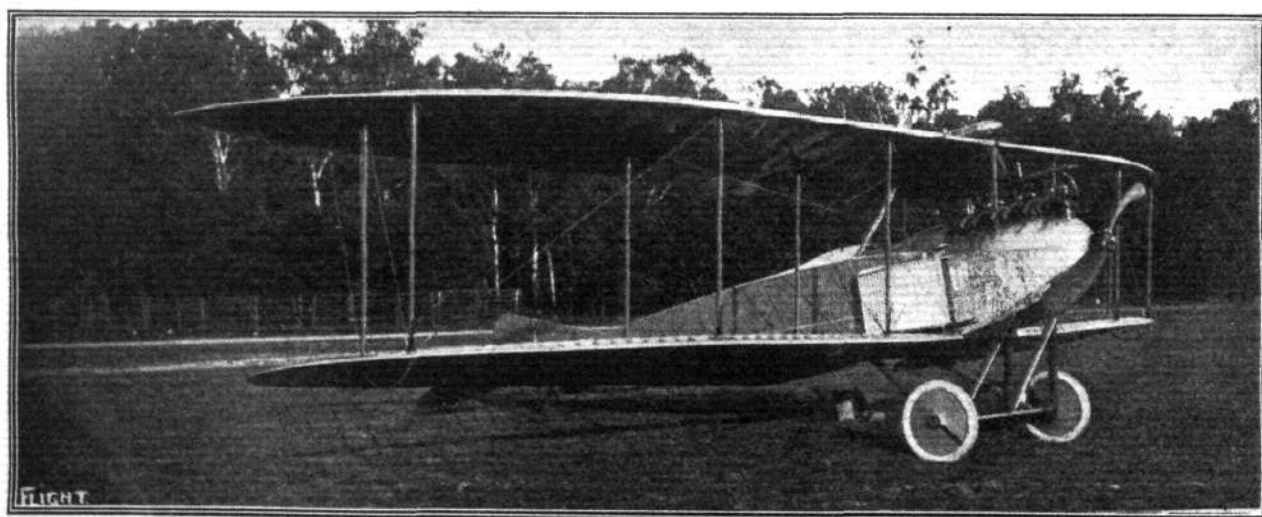
further back is the pilot's cockpit. On a neatly-arranged dashboard in front of the pilot is mounted a very complete set of instruments.

The main planes differ from those of other Arrow-type biplanes, in that they are crescent-shaped. Both upper and lower planes are set at a dihedral angle, and there is a very pronounced "wash-out" of the angle of incidence towards the tips. Small slightly upturned *aileron*s are hinged to the tips of the upper plane. The chassis, like the rest of the machine, is built up of steel tubes, and is fitted with a brake similar to the one used on the Albatros biplane flown by Thelen at Hendon some time ago. With a 100 h.p. Mercedes engine the speed of the

chiefly as regards its *fuselage*. Its main planes, however, are not crescent-shaped, but are similar in form to those of the Beardmore D.F.W. entered for the Circuit of Britain, and which was described in our issue of last week. It is, like the latter machine, built entirely of steel. With a 120 h.p. Austro-Daimler engine it develops a speed of 85 m.p.h.

13. The Etrich Taube,

as the prototype of most German monoplanes, is of particular interest. The wings are of the so-called Zanolia form, having back-swept upturned wing tips, which are flexed up and down for the maintenance of lateral stability. Instead of the usual system of lower



12. The new Arrow-type D.F.W. biplane.

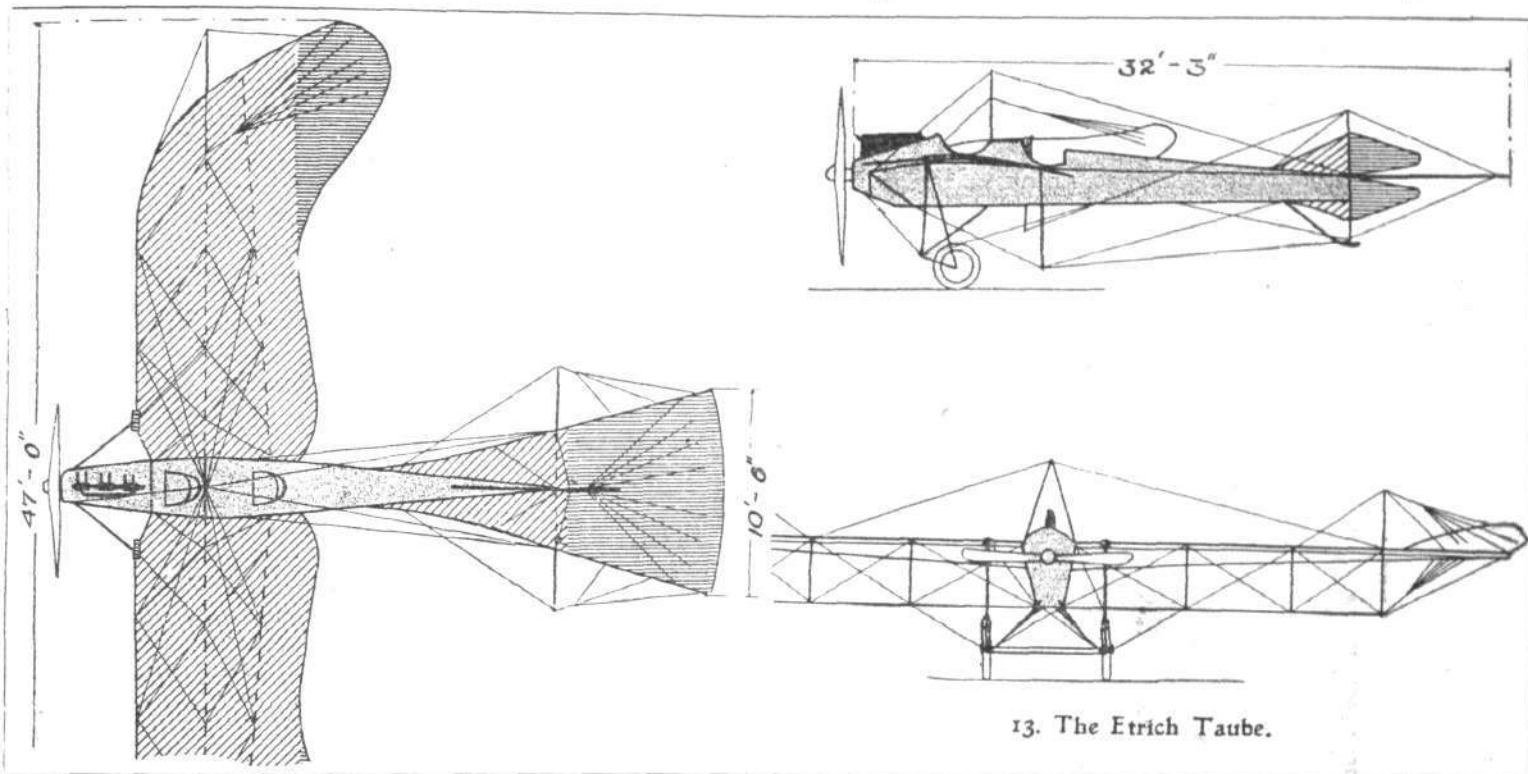


13. The Etrich Taube.

bracing cables a biplane type of bracing is secured by means of a boom running out some distance below and parallel with the wings, to which it is connected by short struts diagonally cross-wired. The outer one of these

narrower at the bottom than at the top, and is provided with a turtle back running over its entire length. The flexing elevator forms a continuation of the fixed portion of the tail plane, and the rudder is divided, one half working above and the other below the tail plane. Pilot and passenger sit tandem fashion, the former occupying the rear seat. The chassis bears a slight resemblance to the Blériot, working on the principle of the deformable triangle, but the shock-absorbing arrangement is different.

The rubber shock absorbers are anchored to the front spar and to a cross piece on the forked chassis strut, so that in heavy landing the spar is likely to suffer, if not breakage, at least weakening through shock. In view of the great amount of head resistance caused by the



13. The Etrich Taube.

struts is continued upwards above the wing to form a king post, which serves as a support for the cables, keeping the wing tips in their upturned position. The fuselage is of nearly rectangular section, being slightly

seemingly unnecessarily complicated wing bracing system employed, it is not surprising that the speed of the machine with a 100 h.p. engine is under 60 m.p.h.

(To be continued.)

TURNER'S PATENT AUTOMATIC CONTROL WIRE TIGHTENER.

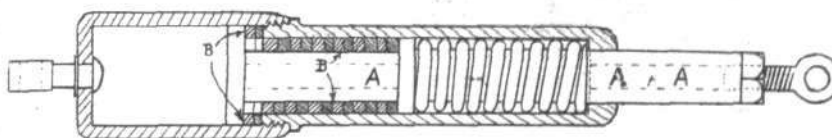
A SIMPLE and ingenious, yet most effective, form of wire strainer for control wires has recently been introduced by Mr. D. E. Turner, of 42, King Henry's Road, N.W., and is shown in the accompanying illustration.

This consists of an outer casing, in two parts, of two different diameters, within which is a spring-loaded plunger, A, upon which a number of spring rings, B, are mounted. At the extreme ends connections are provided for the attachment of cables—that at one end being screwed so that initial adjustments can be made, whilst the connection at the other end can swivel round as necessary in tightening up the wire.

The action of the device is as simple as its construction. The compression on the spring tends to keep the wires in tension, and should any slackness develop, the plunger A is pushed towards the end having the larger bore. As the plunger is expelled, the spring rings in succession expand and become locked between the enlarged end of the plunger

and end of the smaller bore casing as shown, thus keeping the wire taut.

The weight of the tightener illustrated is slightly over four ounces, but another model is manufactured without the spring which is



The Turner control wire tightener.

intended to provide a ready means of tightening up the control wires by hand. This weighs only one and a half ounces, and we understand that several manufacturers have the device now under test, with a view to its adoption.

works at Marblehead, and one which has been built for the Army will be ready to undergo its trials in a week or two.

Burgess-Dunne Machines for U.S. Government.

THE first Burgess-Dunne aeroplane for the United States Navy has recently been delivered from the Burgess

ROYAL AERO CLUB OF THE UNITED KINGDOM. OFFICIAL NOTICES TO MEMBERS.

Aviators' Certificates.

THE following Aviators' Certificates have been granted:—

- 866 William Mortimer-Phelan (Henry Farman type Biplane, Pashley Bros., Shoreham). Aug. 9th, 1914.
867 Flight Sub-Lieut. Norman Sholto Douglas, R.N.A.S. (Bristol Biplane, Bristol School, Brooklands). Aug. 11th, 1914.
868 Frederick Whittington Gamwell (Bristol Biplane, Bristol School, Brooklands). Aug. 15th, 1914.
869 Lionel Seymour Collins (Bristol Biplane, Bristol School, Brooklands). Aug. 15th, 1914.
870 Lieut. Evelyn Paget Graves, R.F.A. (Maurice Farman Biplane, Central Flying School, Upavon). Aug. 18th, 1914.
871 George Llewellyn Pitt (Blériot Monoplane, Blériot School, Brooklands). Aug. 19th, 1914.
872 Eric Barton Palmer (Grahame-White Biplane, Grahame-White School, Hendon). Aug. 20th, 1914.
873 Gordon Lindsay Thomson (Bristol Biplane, Bristol School, Brooklands). Aug. 20th, 1914.
874 Francis Thomas Courtney (Grahame-White Biplane, Grahame-White School, Hendon). Aug. 20th, 1914.
875 Flight Sub-Lieut. William Hayland Wilson, R.N.A.S. (Bristol Biplane, Bristol School, Brooklands). Aug. 21st, 1914.
876 Flight Sub-Lieut. Anthony Rex Arnold, R.N.A.S. (Maurice Farman Biplane, Central Flying School, Upavon). Aug. 21st, 1914.
877 Sub-Lieut. Arthur Lorne Nickerson, R.N. (Bristol Biplane, Bristol School, Brooklands). Aug. 22nd, 1914.
166, Piccadilly, W. HAROLD E. PERRIN, Secretary.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Grounds.

Naval Flying.—During the early part of last week there was quite a lot of flying, the following machines being up several times:—Vickers gun machine, H. Farman, M. Farman, Shorts, Blériot and Deperdussin. Lieut. McClean's biplane. Lord Grosvenor came from Shoreham on his Blériot on Tuesday.

Civilian Flying.—Mr. Alec Ogilvie was out on his Wright 35 h.p. twice. Weather has been generally fine.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Last Saturday week, Messrs. Courtney and Palmer solo circuits, eights, &c. Mr. Crowe rolling alone. Messrs. Greenwood, Morgan

Mr. Palmer circuits, eights, &c., afterwards going in for and passing *brevet* tests, parts 1 and 2.

Wednesday, Messrs. Crowe, Easter, Greenwood, Carabajal, Lister, Hope-Vere, Stalker, straights with Instructors Manton and Russell. Captain Upton solo straights. Messrs. Courtney and Palmer eights, &c., Mr. Palmer completing his *brevet* tests.

Thursday, Messrs. Carabajal, Crowe, Easter, Greenwood, Hawkins, Lister, Morgan, Stalker, Hope-Vere, Whitehead and Wyles straights with Instructors Russell, Lowe, Winter and Manton. Mr. Courtney eights, &c., afterwards going in for *brevet* tests and gaining R.Ae.C. certificate. Mr. Mumby (new pupil) rolling with instructor and afterwards straights. Capt. Upton solo straights and circuits. Mr. Wyles solo straights.

Friday, Messrs. Morgan, Strickland, Hope-Vere, Crowe, Carabajal, Easter, Mumby and Stalker straights with Instructors Manton and Winter. Messrs. Lister and Wyles solo straights, Captain Upton solo eights, &c.

Saturday, Messrs. Crowe, Easter, Hawkins, Morgan, Hope-Vere and Whitehead straights with Instructors Manton, Winter and Russell.

Beatty School.—Pupils are now being personally instructed by Mr. Geo. W. Beatty on dual control biplanes, the pupils out during last week being Messrs. Cheung (16), Ruffy (8), Roche Kelly (25), W. E. de B. Whittaker (20), Lord (37), Hornby (20), Gardner (5), C. Smith (23), Leong (10), Hodgson (12), Bankes (8), and Virigilo (10).

British Caudron School.—Monday, last week, too windy. Tuesday, school out at 5 a.m. R. Desoutter trial flight on 60 h.p. Caudron biplane. Passenger flights to Messrs. Henderson and Legh. Evening, trial flight, too windy. Wednesday, school out at 6 a.m. Passenger flights to Messrs. Hudson, Legh, Johnston and Vernham.

Thursday, school at 6 a.m. R. Desoutter trial flight. Messrs. Legh, Johnston, Henderson and Vernham passenger flights on "60."

Friday, school at 7 a.m. R. Desoutter trial flight. Messrs. Legh and Henderson passenger flights on "60."

Hall School.—Owing to the fact that many of the pupils have received commissions in the Royal Flying Corps there has been little or no practice at the flying school during last week. Advantage has, however, been taken to thoroughly overhaul the school machines and make things shipshape for new pupils. Messrs. J. L. Hall and Clappen were out repeatedly on the machines doing circuits and testing the machines, whilst Messrs. Robert Pinniger and Amelie Cini made several good straights on No. 2 Caudron, improving in practice.



Mr. W. O. U. Purnell, who last week-end passed the tests for his *brevet* at the Pashley School, Shoreham Aerodrome.

(new pupil), Whitehead (new pupil), Hope-Vere (new pupil), Carabajal, rolling with Instructors Russell and Winter. Mr. Strickland straights with Instructor Russell. Capt. Upton solo straights.

Tuesday, last week, Messrs. Carabajal, Morgan, Hope-Vere and Greenwood rolling with Instructors Winter and Russell, and alone. Mr. Courtney solo straights, circuits, &c. Messrs. Crowe, Wyles, Easter, Strickland, Morgan, Stalker, Hope-Vere straights with Instructors Manton, Russell and Lowe. Capt. Upton solo straights.

THE "ROUND BRITAIN" MACHINES.

THE machine officially numbered 4 in the Circuit of Britain was

The **Grahame-White Tractor Biplane**, which was to have been piloted by Mr. Grahame-White. During one of its trial flights this machine, it will be remembered, was damaged on alighting, but previously it had shown that it was capable of doing all it was designed to do; in fact, in several respects it exceeded the expectations of its designer, Mr. J. D. North.

To the casual observer the Grahame-White tractor does not differ a great deal from other machines of its type, but a close inspection reveals a number of interesting features, ingeniously conceived and well carried out. One outstanding feature is its small size—the span is only 27 ft. 10 ins., whilst the over all length is just over 27 ft.—which gives one an impression of speed, an impression that is confirmed by actual figures, for the maximum speed is stated to be 85 m.p.h., and that figure can probably be exceeded.

The *fuselage* resembles that of the Morane monoplane in that it terminates in a horizontal knife-edge at the rear. In section it is rectangular, and the joints between struts, cross-members, and *longerons* are formed, in the rear portion, in a manner similar to those of the Morane, whilst in front, owing to the different weight disposition, the joints are of varied form.

An aluminium shield encloses the greater part of the engine and extends backwards up to the passenger's seat. A turtle back consisting of three ply wood in front and stringers covered with fabric in the rear, tops the *fuselage*.

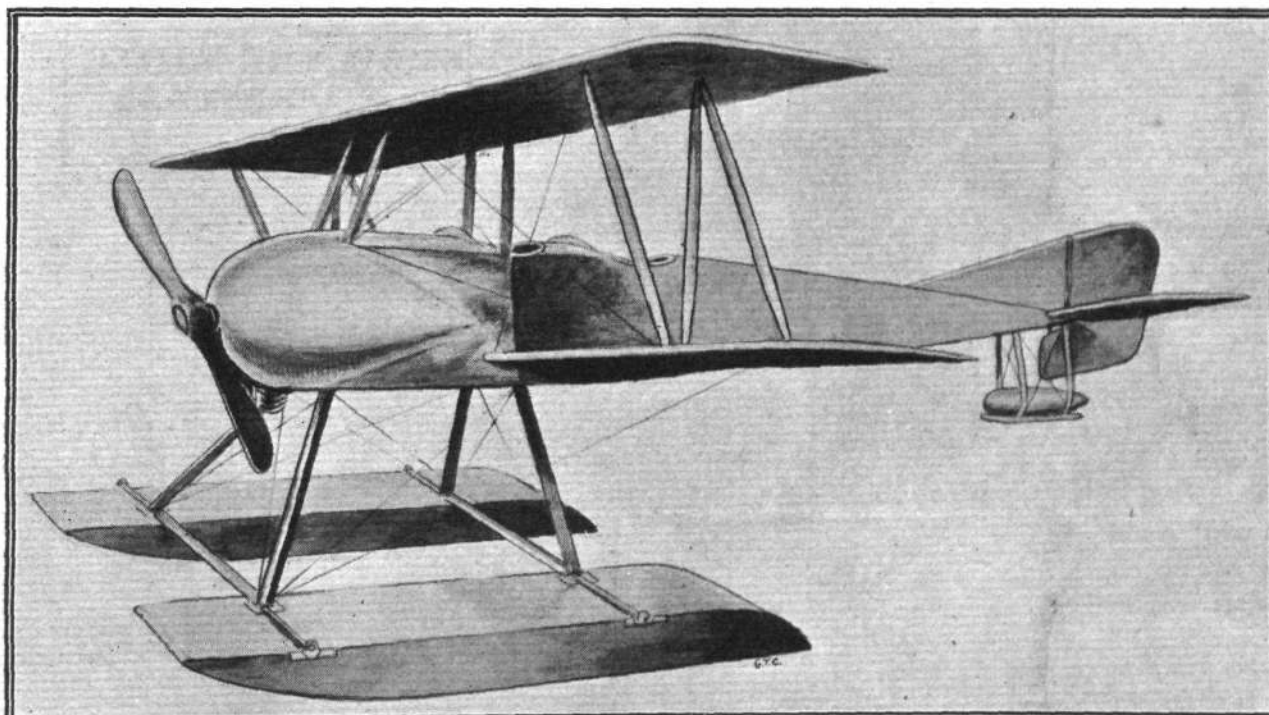
Pilot's and passenger's seats are arranged in tandem, the former occupying the front seat, which is built into the petrol tank, situated between pilot and passenger. Lateral and vertical control is by means of a single central tubular column, terminating in an elliptical handle on which is mounted the engine switch. A to-and-fro movement operates the elevator, whilst the *ailerons* are actuated by rocking the lever from side to side. Foot steering is effected by means of a pivoted foot bar mounted on the floor of the *fuselage*.

In the arrangement of the main planes several departures from usual practice are to be found, notably in the method of strutting employed. Only one set of struts is fitted on each side, but this comprises three instead of two struts. In addition to the struts connecting front and rear spars

of upper and lower planes respectively, a third strut runs from the front spar of the lower plane to the rear spar of the



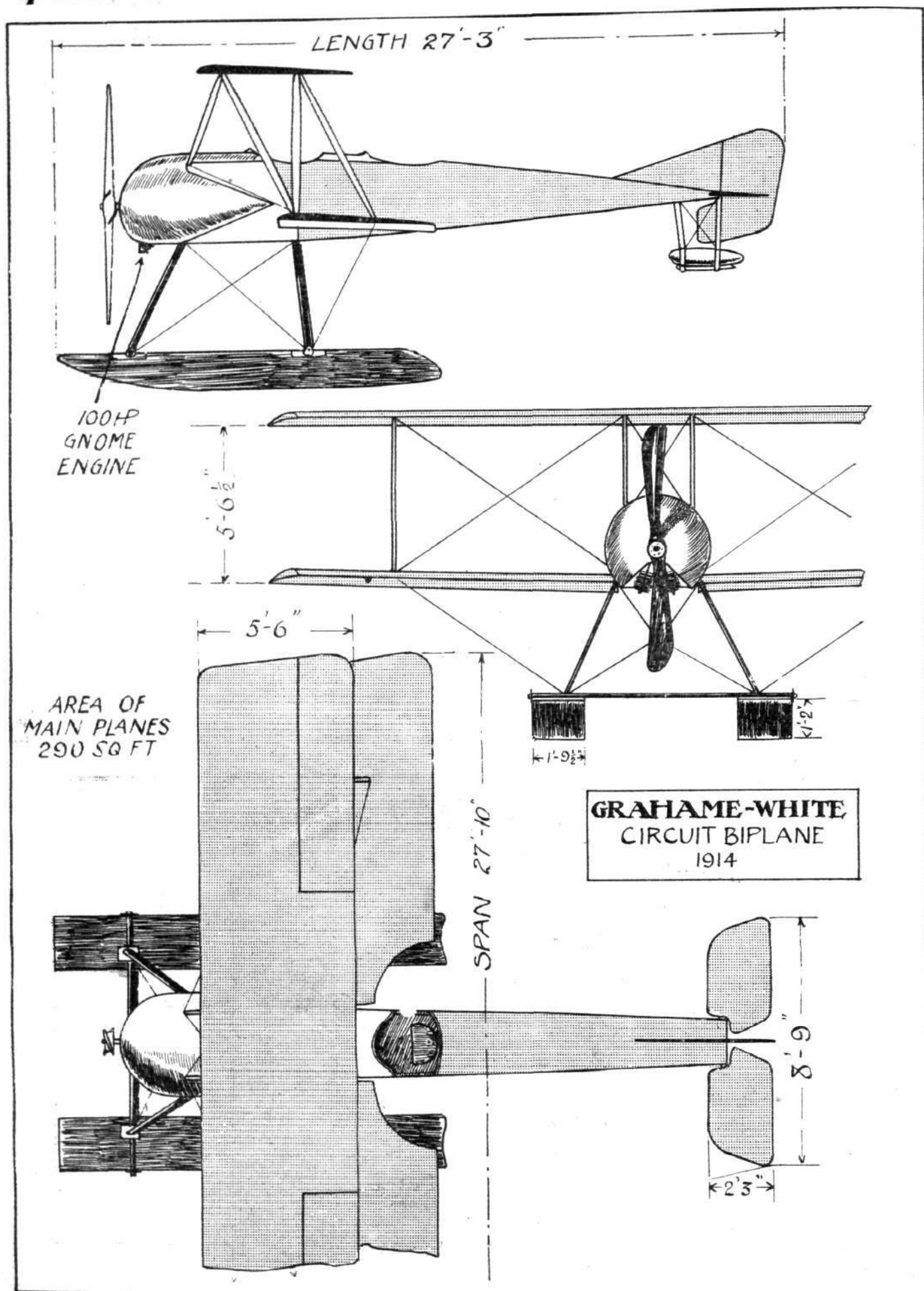
Mr. Claude Grahame-White, who was to pilot the Grahame-White tractor biplane in the Round Britain race.



ROUND BRITAIN MACHINES. No. 4.—The Grahame-White tractor biplane.

In the extreme nose of the machine is mounted a 100 h.p. Gnome *monosoupape* engine, supported on three bearings, of which the front one is self-aligning.

upper plane. On account of the very pronounced stagger, this third strut is nearly vertical and is in the same plane as the diagonal bracing cable running from the *fuselage* to the



ROUND BRITAIN MACHINES, No. 4.—The Grahame-White tractor biplane. Plan, side and front elevations to scale.

attachment of the strut to the upper rear spar. From a steel clip on the lower *longeron* other cables run to the upper extremities of front and rear struts. This method of bracing is somewhat unusual, but in the opinion of the designer combines great strength with low head resistance. The struts themselves are of unusual construction, in so far as they consist of steel tubes totally enclosed in streamline wood casings, a construction which renders them immensely strong. They are attached by means of steel clips gripping the spars without piercing them. The latter are of hollow section and bound with fabric, and during a test to which one of these spars was subjected it carried a load of eight times the weight of the whole machine without any perceptible deflection.

In addition to the heavy stagger the main planes are interesting on account of the fact that the lower plane is set at a smaller angle of incidence than the upper one, the two angles being 3° and 5° respectively. The object of this arrangement is to improve the longitudinal stability of the machine, and the results obtained in practice show that it answers its purpose. A dihedral angle of 2° to the lower plane increases the lateral stability. The

upper plane, which is straight, is fitted with interconnected *ailerons*. In order to give a good view from the pilot's seat in a downward direction, the trailing edge of the lower plane has been cut away near the *fuselage*. From the passenger's seat the view in a forward and downward direction is practically unobstructed, and that it is comparatively easy to get out of in case of a smash was proved by Mr. North recently, when he managed to "bubble" to the surface when his seat was totally submerged.

At the rear of the *fuselage* are carried the tail planes, which resemble those of the Morane monoplanes as regards the elevator. No stabilizing plane is fitted, but a vertical fin extends forward from the rudder. A small metal float takes the weight of the tail planes when the machine is at rest.

The chassis consists of two floats, carried on a structure of four stream-line steel tubes, held rigid by means of stout stranded cables.

With full load on board, including 50 gallons of petrol, 9 gallons of oil, or sufficient for a flight of $5\frac{1}{2}$ hours' duration, passenger and pilot, the machine develops a speed of about 85 m.p.h.



EDDIES.

If anything is capable of working changes quickly and altering the usual order of things which have been taken for granted, surely it is war, and a visit to Brooklands just now emphasises the fact. Brooklands is a place where one has been accustomed in the past—it already seems long ago—to stroll round from one shed to another examining, with the interest of the enthusiast, technical details of machines either newly arrived or in the course of construction, discussing their merits with the designers or their behaviour with the pilots, as the case might be. When tiring of this, which was not until the tour of all the sheds had been completed, there was the "Bluebird"—that aviators' stronghold—where there was always a group of pilots in whose company a couple of interesting hours could be spent "talking shop" or listening to amusing relations of incidents well told, for there appeared to be among the Brooklanders a great number of excellent *raconteurs*. Now, however, all is changed. Brooklands is in the hands of the R.F.C., the "Bluebird" is not the "Bluebird" but the "Canteen," and nearly all the familiar figures which used to adorn the landscape have gone.

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The Vickers, Bristol and Sopwith sheds have been turned over to the R.F.C., as have also nearly all the hangars adjoining and at the back of the "Bluebird"—I beg pardon, "Canteen." I understand that Blériots and the Martinsyde firm are going to continue constructional work, but that the other firms, which, with few exceptions, have works elsewhere, have received "marching orders."

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From Mr. Stutt, the Bristol pilot, who was busy teaching pupils, I learned that his engagement would terminate on Satur-

day last, when the school would be taken over by the authorities. Mr. Jack Alcock, of Sunbeam fame, was sitting on a petrol tin, a picture of utter dejection, his face buried in his hands. I can sympathise with him, for not only had his beloved Sunbeam-engined M. Farman been taken from him, but he was under orders to vacate the cosy little cabin which he had rigged up in one corner of his shed. Fortunately, his gramophone had not been commandeered, and soon, to the tune of

"It's a long way to Tipperary," he forgot—at least temporarily—the loss of his M.F.

By the way, I hear that he made a short flight on P.B. IX the other day, so it is possible that we may see Alcock as pilot of a scouting biplane one of these days, for although most of his experience in flying has been gained on machines of the pusher type, a flyer of his abilities should have no difficulty in mastering a tractor.



Among the pilots who are leaving Brooklands is Mr. Harold Treloar, of Ballarat, who, as recorded in "Eddies" some time ago, obtained his *brevet* at the Bristol school after only three weeks' tuition, and who has since been taking an extended course at the Blériot school in order to get some experience in the handling of a monoplane. Mr. Treloar is leaving for Australia on the R.M.S. "Osterley" this week, and hopes, as soon as the war is over, to purchase a Blériot monoplane of the same type as the machine that he has been flying at Brooklands lately, and which he considers ideal for the pilot-owner. It is to be hoped that Mr. Treloar may arrive safely at his destination, and soon be able to help on the good work of assisting the cause of aviation under the Southern Cross. *Bon voyage!*

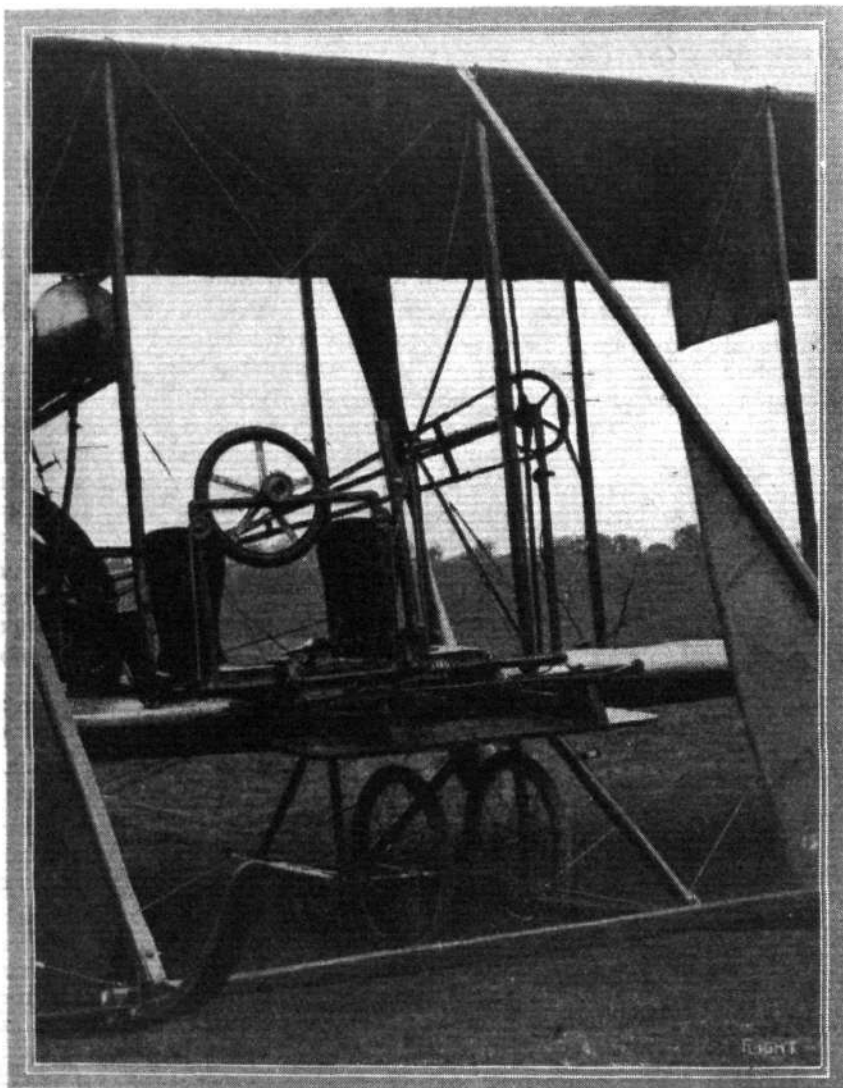


Lieut. J. C. Porte, who is in charge on behalf of the Royal Naval Air Service at Hendon.

Although not receiving a great amount of publicity a good deal of work has been done by the machines of the Lakes Flying Company over Lake Windermere. Since the early part of 1912 Mr. Stanley Adams, their manager and pilot, has been running a passenger service, which will now have to be discontinued, at any rate for a time, as Mr. Adams has been offered and has accepted a commission as sub-lieutenant in the Royal Naval Air Service. If it is found possible to secure the services of a good pilot, the Lake Windermere passenger carrying will be resumed.

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As an instance of the amount of school work done at Hendon in these times, it may be mentioned that on Thursday of last week instruction was given the pupils at the Grahame-White School for 11½ hours, which is, I should think, something in the nature of a record. Work was commenced at 6.30 a.m., and was continued up till 8 p.m., with only two hours' rest for breakfast and lunch. Small wonder that they are turning out pupils in record time.



THE DUAL CONTROL ON MR. BEATTY'S WRIGHT BIPLANE. As Mr. Beatty is accustomed to and prefers the original Wright control, the school machines are equipped with this type for the instructor, whilst the pupils' controls are similar to those most favoured by European designers, consisting of a hand wheel for the warp, mounted on a steel tube structure to which is connected the elevator, and a foot bar for the rudder. These are ingeniously interconnected with the Wright control so that both act simultaneously.

Mr. M. Manton, who is now installed as chief instructor to the Grahame-White School at Hendon, is—or was—an enthusiastic amateur wireless operator, and had quite a useful set of instruments at his house in Collindale Avenue. During present conditions, however, “wireless amateurs” have had to suspend operations, and Mr. Manton now proposes to utilize his mast for a different purpose. To the top of this he intends to fit an anemometer and connect it up by tubes to a Pitot tube in his room that will show him the wind velocity so that if a glance at the “gadget” shows the wind to be too strong for school work, he can turn over and have another hour's rest. Mr. Manton will be obliged if any of my readers can suggest an arrangement that will indicate fogs and rain, as by the aid of such an instrument and the Pitot tube, suitably connected up *via* an alarm clock to a bucket of water suspended over his bed, he would be able to enjoy the sleep of the righteous up to the last second.

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The visitors to the Hendon Aerodrome on Saturday were treated to several very fine exhibition flights by Messrs. Beatty, Manton and Lillywhite. Beatty was first out, and gave some excellent demonstrations of steeply banked turns, spirals and switch-backs. He was followed a little later by Manton, who proved to have lost none of his skill in handling the bi-rudder 'bus. Shortly afterwards Lillywhite, who was on leave from the R.F.C., took up the same machine and executed some steep banks and dives, much to the delight of the spectators.

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I had the pleasure of a short chat at Hendon on Saturday last with Lieut. J. C. Porte, who, having had to put off the attempt to cross the Atlantic this summer, is now back in this country in order to place his services at the disposal of the Royal Navy. He is now in charge of the Naval Department at Hendon, where pilots are being trained for the Royal Naval Air Service. I understand that Mr. Claude Grahame-White and Mr. Richard T. Gates have been appointed to assist Lieut. Porte.

x x x

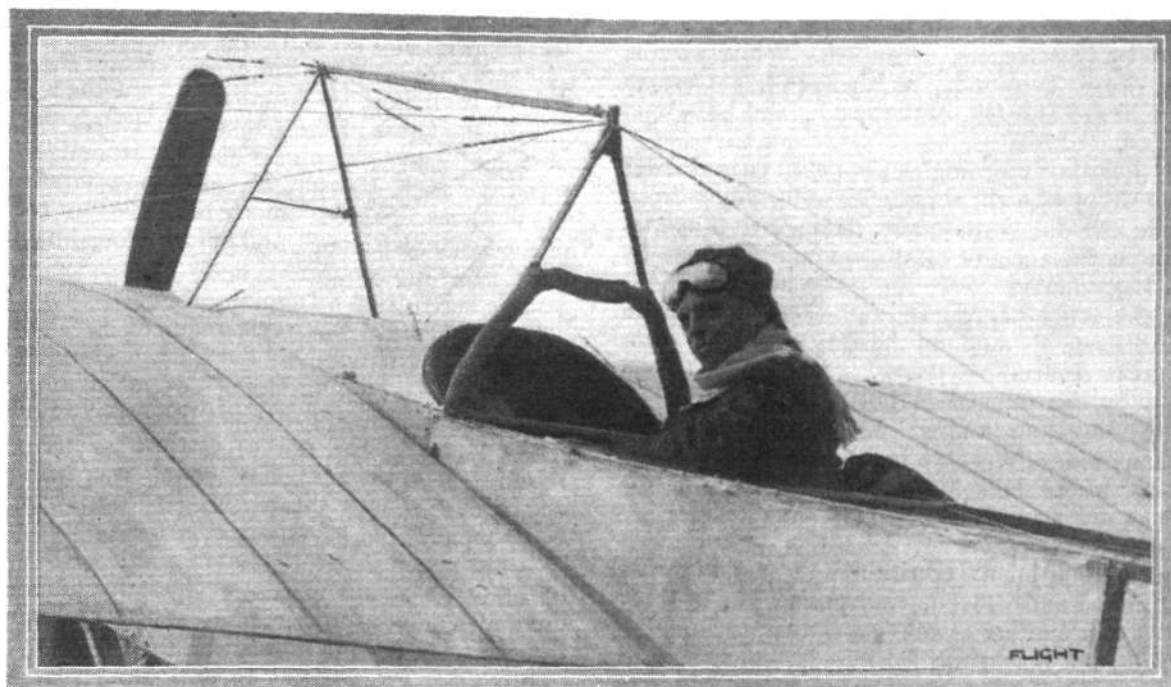
With regard to the trans-Atlantic flight Lieut. Porte expressed himself very pleased with the “America” once she was in the air, the only difficulty being that of getting her off the water. He is confident, however, that with the aid of the valuable data obtained with the “America” on her trial flights, it will be possible to design a new hull which will leave the water more easily, and thus allow the machine to be taken into the air with full load on board. The new attempt will not, of course, be made until after the war.

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Mr. J. L. Hall, who was, by the way, erroneously reported to have joined the R.F.C., but who is, as a fact, still running his flying school at Hendon, told me of an exciting adventure he had the other day. Going up from one of the aerodromes—What's that? No, I will not give away the locality—he went for a little cross-

country flight, and in so doing got outside the 3-mile limit, when, all of a sudden, he found himself over some encampments. He was then flying at an altitude of about 3,000 ft., and his attention was attracted to a number of small puffs of smoke. At first he did not

friendly feelings towards them, but all to no avail, his graceful "stunts" were apparently taken as indication that the machine had been hit, and the rifles seemed to redouble their efforts. On discovering this, it did not take Hall long to get the nose of his machine pointed in



Mr. Harold Treloar in his Bleriot at Brooklands.

realize what they meant, but after watching them for a few moments it occurred to him that he was the target for a most energetic rifle fire, the reports of which his engine had prevented him from hearing. He tried to show the troops below, by a series of spirals and banked turns, his

the direction of the sheltering aerodrome, and luckily he succeeded in making a safe landing. The next time Hall goes for a little jaunt across country it will be at 6,000 ft.

"ÆOLUS."



AIRCRAFT AND THE WAR.

DURING the week which has passed since the events recorded in our last issue reliable information as to the use of aircraft in the fighting line has been very meagre, the most important item being that recorded in a French official *communiqué* of the 23rd inst.:

"The Zeppelin No. 8 was brought down on the road from Celle to Badonviller. It was coming from Strassburg."

"Z 8" was the latest Zeppelin to be received by the Germany Army, and had not been in commission very long, her first trial trip being on March 31st last, when it may be remembered, during a five-hour trip over Switzerland, she passed over Mont Sentis, in the Appenzell Alps, at a height of 3,065 metres. She is a sister airship to the Z 7, which underwent her trials in January last. She was 156 metres long, with a diameter of 14.8 metres, and the capacity was 22,000 cubic metres. She was fitted with three 180 h.p. Maybach motors driving four propellers. Badonviller is about 20 miles from Luneville and five miles from the frontier.

It was reported from Ghent that on the 19th inst., during the fierce attack on Diest, two German aeroplanes were flying low over the Belgian positions, while on the following day a number of German machines were seen over Ghent and the neighbourhood.

From East Prussia it was reported that Russian aviators were dropping bombs on military buildings, although no

details have been published as to the amount of damage which was done.

On the evening of the 20th, a Zeppelin was reported at Zevenaar, on the Dutch frontier, following the course of the Rhine. It was fired on by the Dutch soldiers, but without effect. Apparently the same craft was also seen at Maestricht using searchlights, and eventually disappeared in the direction of the German frontier. On the same day, according to a French official statement, a dirigible flew over the German lines and dropped several bombs on two cavalry encampments in Belgium. The projectiles hit their mark and caused considerable disorder. All lights were at once extinguished in the camps, and a number of shots were fired on the aircraft, which, however, returned in safety to the French lines.

Another official statement by the French Ministry of War relates how a French airman encountered a division of German cavalry when on a reconnoitring trip in Lorraine, and dropped several bombs.

They did great damage to the ranks of the enemy. The aviator made good his escape to his own lines.

Two other French airmen were brought down by rifle fire in territory held by the Germans, but by hiding in a wood until after dark, they not only made their way to their own lines but also rescued another pilot who had been shot in both legs. Also, on the 20th, a German

aeroplane, which came from the direction of Brussels, was fired on by Dutch patrols between Oostburg and Harbenburg in Zeeland. It is stated that of six shots fired three did such damage to the engine that the machine descended, and the pilot was taken prisoner. On the 21st, a German Taube monoplane was seen over Antwerp, but disappeared when Belgian machines, one of them piloted by Olieslaegers, ascended. While passing over Asche, near Termonde, on the 22nd, a German machine caught fire and fell, both the pilot and passenger being killed.

Early on Tuesday morning a Zeppelin passed over Antwerp and dropped eight shrapnel bombs, which killed several people and did considerable damage to property. The following is the account of the outrage sent out by the Belgian Legation:—

"During the night of August 24th-25th a Zeppelin flew over Antwerp at medium height, dropping eight bombs of great destructive power. According to the inquest held by the judicial authorities ten people, all civilians, including four women, were killed, and eight wounded, some mortally. One bomb exploded over the Royal Palace, where Her Majesty the Queen and the young princes are staying. The material damages are considerable.

"Such a bombardment constitutes a violation of Article 26 of the Fourth Hague Convention."

It is stated that another attack was attempted on the following night, but that it was frustrated. According to a message from Amsterdam the United States Minister has protested against the Zeppelin's attack on the peaceful citizens of Antwerp.

A report from Paris states that in the fierce fighting round Charleroi, a German aeroplane was shot down at Solre-le-Chateau, and that another met with a similar fate at Nerles.

Although exact details as to the work of aircraft are not available, a hint as to the part they are playing is given by a reference in the French official *communiqué* dealing with the operations round Mulhausen. It stated: "We knew by aircraft reconnaissances that the Germans had left between the French frontier and Mulhausen a relatively small number of troops, and that the bulk of their forces were on the right bank of the Rhine."

In its protest to the Hague Convention relative to the bombardment of Pont-à-Moussons, an open and undefended town, the French Government pointed out that the Germans, by the aid of an airship stationed above the batteries, directed the fire more particularly upon the hospital, an historic monument, properly denoted by a Red Cross flag.

During last week French aviators flying over Alsace and Lorraine distributed a number of leaflets printed in German and French, relating how Germany had violated the neutrality of Belgium and Luxemburg, and explaining Great Britain's intervention and Italy's neutrality. It also set forth Belgium's heroic resistance and Russia's advance, and concluded: "To-morrow your sacred land will be delivered for ever from the yoke of Imperialism." Similarly on Sunday week a French aviator scattered

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Cody's Assistant Killed.

MANY who were brought into contact with the late Col. Cody will remember his son-in-law, James Carroll, who used to assist him, and will regret to hear that he died on Friday of last week. It appears that when near a railway bridge at Aldershot he was challenged by a

handbills over the neighbourhood of Liège, reading, "Keep up your courage, people of Liège! We win."

On Thursday of last week Pegoud was in Paris, and in an interview stated that he had flown 180 miles into German territory and had dropped bombs on two German convoys. He also stated that Capt. Finck had destroyed the Frascati airship shed at Metz, together with the Zeppelin and three Taube monoplanes.

There was a touching ceremony in the Place des Armes at Belfort on Monday last, when General Pau pinned the Cross of the Legion of Honour on the breast of Capt. Langlois, who, although wounded during a reconnaissance, brought his machine safely back to the French lines. The ceremony took place in the presence of the assembled troops, and before a long line of captured guns, while the accolade is said to have been given with a sabre taken from a German officer.

The *Morning Post* correspondent in Paris reported that on the afternoon of the 26th a German aeroplane flew over Cambrai, dropping several bombs, of which only one took effect, damaging the railway bridge. The troops guarding the railway station opened a vigorous fusillade upon the aeroplane, which was hit many times and collapsed into the public gardens. The pilot was badly injured, but his companion was unhurt.

It was also reported that as a result of being fired on by French Customs officers a German aeroplane caught fire and fell in the British lines in the Quesnoy district, the two officers being killed.

From St. Petersburg comes a story that a party of village women have captured some Austrian aviators who descended at Bamen on the Austro-Russian frontier. The Austrians threatened to use their revolvers, but they were, nevertheless, overpowered.

In a Russian *communiqué*, dated August 23rd, it is stated that an Austrian aeroplane was brought down to the south of Groubeschove and that two officers were killed and a third wounded.

A telegram from Friedrichshafen to Paris says that Count Zeppelin, who is now seventy years of age, has volunteered for service, and will take command of a Zeppelin airship. Count Zeppelin, it is stated, saw active service in 1870 as a lieutenant in a Hussar regiment.

In a statement in the *Echo de Paris* as to the rôle so far played by aircraft in the war, M. Blériot says: "I think that the last word is with the guns. It is true that at the present moment the aeroplane has rendered signal services to our arms, especially in connection with reconnaissances. From this point of view our pilots and aviation officers seem to be more daring and particularly more experienced than their adversaries. But so far as the combatants are concerned, they have practically no part to play. To achieve a really efficacious result it would be necessary to have some thousands of them, whereas we only have hundreds. I do not think that the dirigible has distinguished itself by any remarkable prowess."

It was reported from Paris on Wednesday that M. Voisin, who volunteered for service with the French airmen, had been mentioned in despatches for signal services rendered to the Army.

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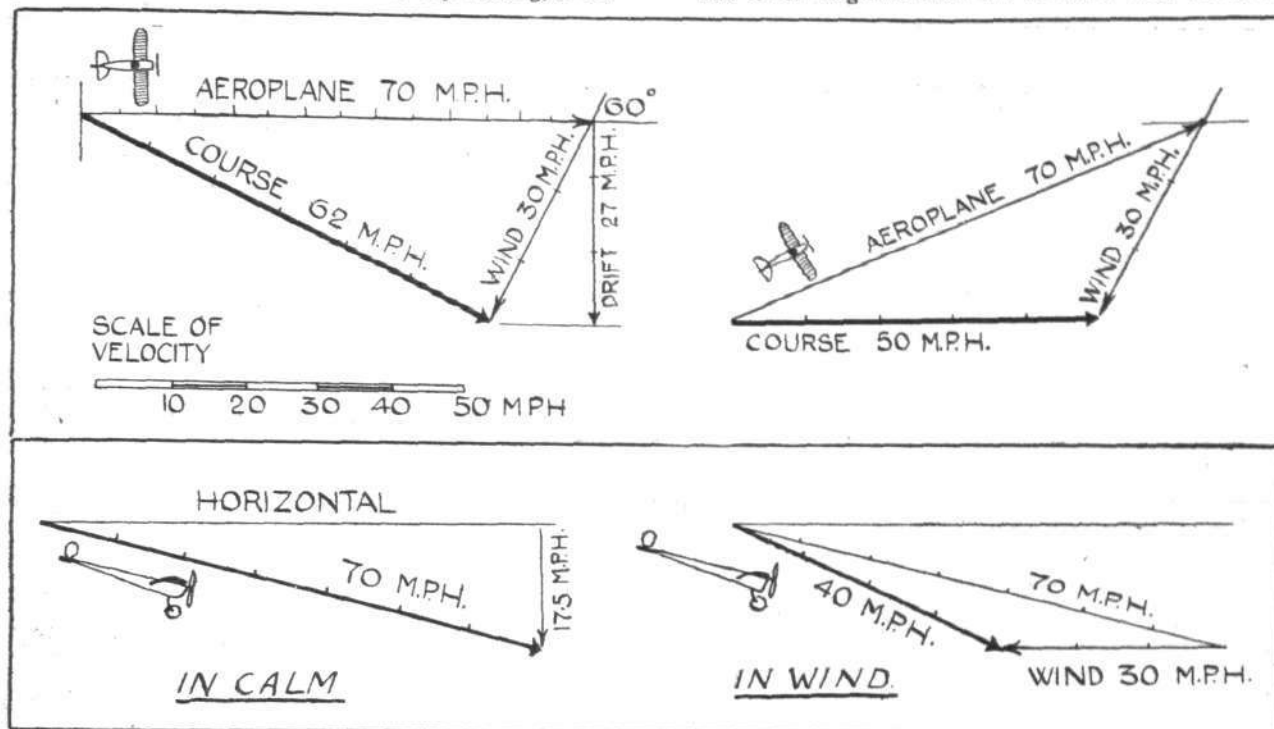
sentry, but as he was very deaf Carroll did not hear the challenge, although it was repeated six times. The sentry therefore fired, and he died from the wounds the following day. This sad occurrence illustrates how extremely careful sufferers from deafness should be just now, when near military works, important bridges, &c.

DIRECTION OF FLIGHT IN A WIND.

PROBLEMS relating to the course of flight in a wind are best solved graphically. For example, a machine capable of 70 m.p.h. flies in a wind of 30 m.p.h. A line representing the wind in direction and velocity is drawn from one end of another line representing, to the

at right-angles to the direction in which it is facing is similarly found to be 27 m.p.h. If the machine turns into the wind as shown in the right-hand diagram, its course speed is reduced to 50 m.p.h.

The lower diagrams show the effect of wind on the apparent



"Flight" Copyright

Diagrams illustrating graphic solutions to problems relating to the effect of winds on the flight of aeroplanes.

same scale, the calm air flight speed and direction of the aeroplane. A third line completing the triangle gives the resultant course and speed of the aeroplane relatively to the ground, and when measured in this instance to be 62 m.p.h. The lateral drift of the machine

LIFT COEFFICIENT AND WING LOADING.

It is becoming the general practice to express the results of model wing tests in absolute coefficients, so that they may be directly comparable in all countries without reference to the system of units employed.

The result of the N.P.L. test on the wing section Eiffel No. 13 is shown in the diagram, and the lift coefficients are absolute.

A lift coefficient of 0.3 implies that the wing will lift:—

$$0.3 \frac{\rho}{g} v^2 \text{ lbs./sq. ft.}$$

where ρ = density of air, g = gravity, and v = flight speed in ft./sec.

For approximations, the following table, given in the Technical Report, is useful for converting absolute coefficients into lift in pounds per square foot.

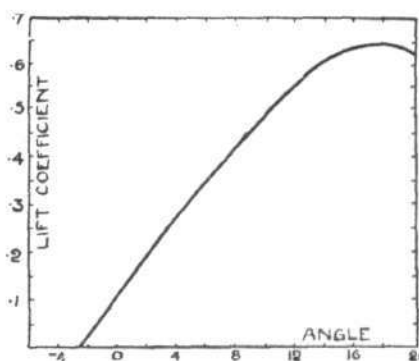
Speed.	Conversion	Speed.	Conversion	Speed.	Conversion
m.p.h.	factor.	m.p.h.	factor.	m.p.h.	factor.
40	8.15	70	25.0	90	41.5
50	12.7	80	32.6	100	51.0
60	18.3				

For example, a lift coefficient 0.3 indicates that the wing will lift $0.3 \times 18.3 = 5.5$ lbs. per sq. ft. at 60 m.p.h.

In Eiffel's work, the lift, and also the resistance of the wing are given simultaneously by what is called a "polar curve." The coefficients employed may be converted into absolute coefficients by multiplying by 8.

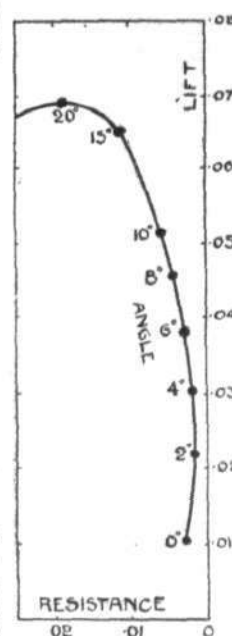
gliding angle of the machine as visible to the eye. In calm, the machine glides as shown on the left; in a head wind of 30 m.p.h. it descends more steeply, as shown on the right, but its true gliding angle through the air is unchanged.

Diagram illustrating the method of plotting the lift of a wing in terms of absolute coefficients and angle of incidence in degrees.



"Flight" Copyright.

On the right, Eiffel's polar curve method of showing the lift and resistance of a wing by a single graph. The scale of Eiffel's curves may be converted into absolute coefficients by multiplying by 8.



The Price of "Shell."

THE distributors of "Shell" motor spirit announce that by arrangement with the Society of Motor Manufacturers and Traders no more than the following prices will be charged by their members to the public in England and Wales:—

Shell, 1s. 9d. per gallon; Shell II, 1s. 7d. per gallon; Crown, 1s. 6d. per gallon.

Users should advise the Company immediately if the prices charged are in excess of the above. It is imperative that cans should be returned immediately they are empty.

Models

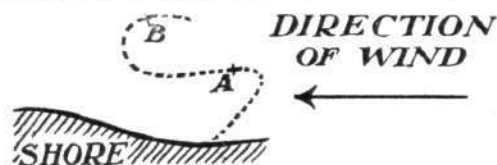
Edited by V. E. JOHNSON, M.A.

Mr. W. A. Smallcombe's Model.

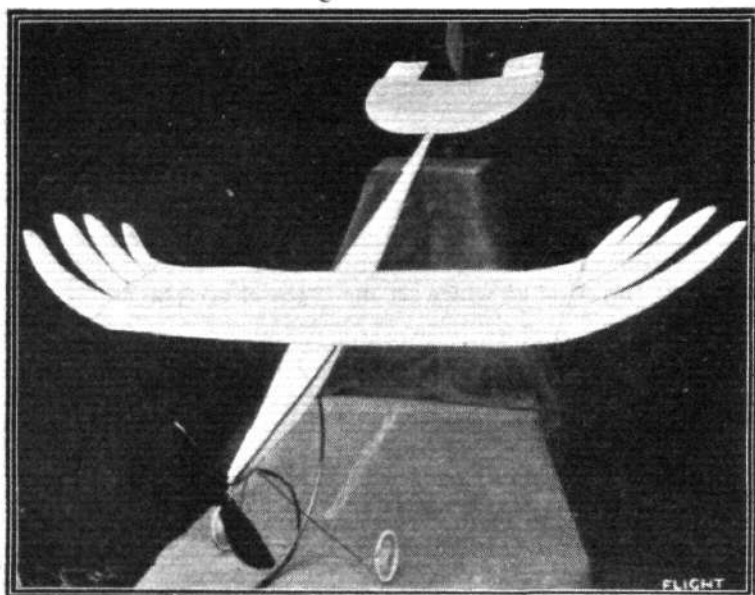
WE give this week some further particulars and photo. of Mr. Mr. Smallcombe's interesting model, referred to in last week's issue, the special features of which are that the main supporting surfaces are designed like the wing of a rook, and tipped with feathers, with a view to investigating the stability of such a form of design. "Each feather," says Mr. Smallcombe, "is set at a small negative angle, and corresponds with the first four primaries of a rook's wing."

"The idea of applying such a feature to a model with a view to obtaining both lateral and longitudinal stability, was brought about by closely observing rooks when gliding, each feature acting as an independent lifting surface. Now when the rook glides into a wind the primaries are all closed tightly, slightly overlapping one another, thus reducing the lifting surface considerably, which is quite a desirable thing when turning into the wind. (The wings are also slightly flexed if the wind is very strong.) My idea is that the extra

flight I forgot to so place the rudder as to counteract the torque with the result mentioned later on. After travelling some 10 yards the machine turned out of the wind and rose at A, and continued as far as B some 6 to 12 inches above the water. It was the turn



at B, due to the torque, that caused disaster. Not knowing the correct elevation, it so happened that the model was under elevated, with the result that the machine dropped in consequence, when turning, drove her floats in with a big splash, and after floating



Mr. W. A. Smallcombe's "rook" model.

wind pressure on the upper surface of the feathers tends to close them together, and they open by their own springiness when the pressure is released.

"When I first made the model I only put on one rudder of 4 sq. ins. area. With this the model rolled rather badly in the air unless the rudder was in the exact position. I have now fixed on a fin 12 sq. ins. in area, in addition to the rudder, and the stability and control are almost perfect. I had hardly any trouble with the longitudinal stability. My longest flight to date is 150 yards, hand launched, and 100 yards off the ground."

Particulars of 0-81-1-1 "Rook"-type Model.

Length overall, 41 ins. Main plane, span 30 ins., chord 6 ins., with four feathers on each wing tip, graduated from 11 ins. by 2 ins. to 4 ins. by 1 in. Tail, made of 19 gauge steel wire; span 12 ins., maximum chord 6 ins., two elevator flaps 3 ins. by 1.5 ins. Fin, 12 sq. ins., and rudder 4 sq. ins., both constructed of 19 gauge steel wire. Body, boat-shaped V-section, with maximum depth and breadth about one-third from the front. Tractor screw, diameter 11 ins. and 16 ins. pitch. Chassis, cane and 19 gauge steel wire. Wheels, 2.75 ins. aluminium, rubber (Messrs. J. Bonn and Co.). Rubber motor, contained within the body; weight of rubber 1.25 oz. Total weight of machine 9.5 ozs.

Mr. L. H. Slatter's Steam-Driven Model.

We have received the following communication from Mr. Slatter: "Just a line to let you know how I got on yesterday morning. As you are probably aware, the weather was not absolutely ideal. Having risen at 5 a.m. and my friend Connolly having turned up, we set out. The first attempt was made against the wind. Before the



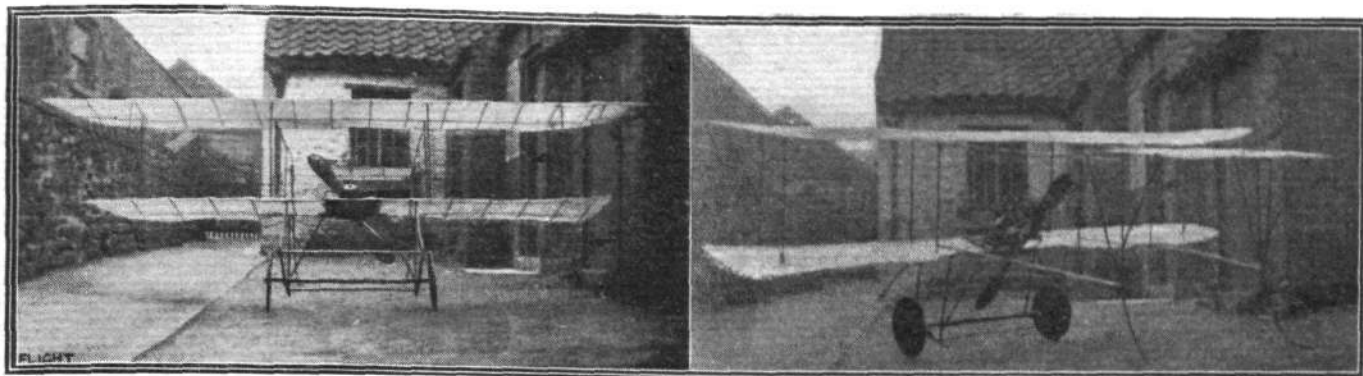
Mr. L. H. Slatter and his power-driven hydro-aeroplane, as seen from the front.

back to within a stone's throw, she overturned. This, of course, filled the wings with water, making her very wet and heavy. The plant, however, started up again all right, and I decided to have another try, but the lamp was out (turned), so we didn't succeed in getting a second attempt. The plant is quite all right but I think it essential to start with the wind in future." Better luck next time.

Wind Tunnel Tests of Models to Ascertain Best Lift/Drag Ratio.

In the *Aeronautical Journal* for July the rules for the above competition are published, and they are also published in the official programme of the K. and M.A.A. We think this competition, of a purely scientific character, cannot be too widely known or the rules which govern it, so we publish them below. Rule 6, it is noticed, is not yet complete; we certainly think this rule should be completed at once, and all the time possible given to competitors to work at their designs in every detail. We certainly hope, even under present circumstances, that not only will all the leading model designers submit models, but many others as well. The rules, briefly put, are as follows:—

1. Span of model 24 ins.
2. No model accepted which has not flown 150 yds., wind velocity allowed for.
3. Models will be retained by K. and M.A.A. after flying tests, until laboratory tests are finished.
4. Models must have propellers, so fitted as to revolve freely when rubber motor is detached.
5. Rubber kept on model during the laboratory test, approximately in position but detached from propeller.



Mr. K. Wilson's power-driven model from the front, and as seen from behind.

6. A special fitting must be fixed to the model so that an attachment can be made, from the underside of the model, to the balance arm of the wind tunnel apparatus. The design of this fitting to be published later. [Does the model fly with this fitting attached?]

7. No responsibility as to damage, &c.

8. Prizes: 1st £3, awarded to the model giving the best lift/drag ratio at a wind speed of 18 m.p.h. in the tunnel; 2nd prize 30s.; 3rd prize 10s., for next best result. The prizes are given by the Aeronautical Society.

The Lanchester Trophy for Model Gliders.

The same journal also contains the following: "Mr. F. W. Lanchester has asked the Society to undertake the awarding of an annual trophy given by him for the purpose of encouraging research into the best shape of aerofoils. Full details will be announced later."

Mr. K. Wilson's Model Experiments.

"Some time ago," writes Mr. Wilson (Durham), "you mentioned in your columns that you would like to hear from your readers their experiences with model aeroplanes, whether successful or not. I am now about to take advantage of the same. First of all, I may say I have had more failures than anything else. I commenced in the summer of 1909 with small models of the Wright type, with a span of 2 to 3 ft.; by the end of that year I had succeeded in making one fly 100 yards. I then turned my attention to power-driven models, and constructed a biplane Farman type, with a span of 8 ft. and double-surfaced planes, having an area of 24 sq. ft. The weight complete with power plant, which consisted of a 0.75 h.p. petrol engine driving a 22 in. diam. propeller (Cochrane), was 22.5 lbs. The engine was a single-cylinder one and weighed, complete with coil, accumulator, &c., 11 lbs. The static thrust of the propeller was 5 to 5.25 lbs. After several trials, I came to the conclusion that it was too heavy; so I made another model, with a span of 10 ft., chord 1 ft. 6 ins., gap 1 ft. 6 ins., and 34 sq. ft. of surface; the total weight being 20.5 lbs. After several trials, which were failures owing to engine troubles, bad weather, &c., I managed one evening to get the model to rise after a run of about 30 yds.; when it was about 18 ft. high I brought it down by means of a string, which was fastened to the back skid. At that time I had no other means of bringing the machine down, and the engine would run for 15 mins. The model landed flat on the ground and the model collapsed, the propeller being smashed in two.

"I afterwards strengthened the chassis, which increased the weight

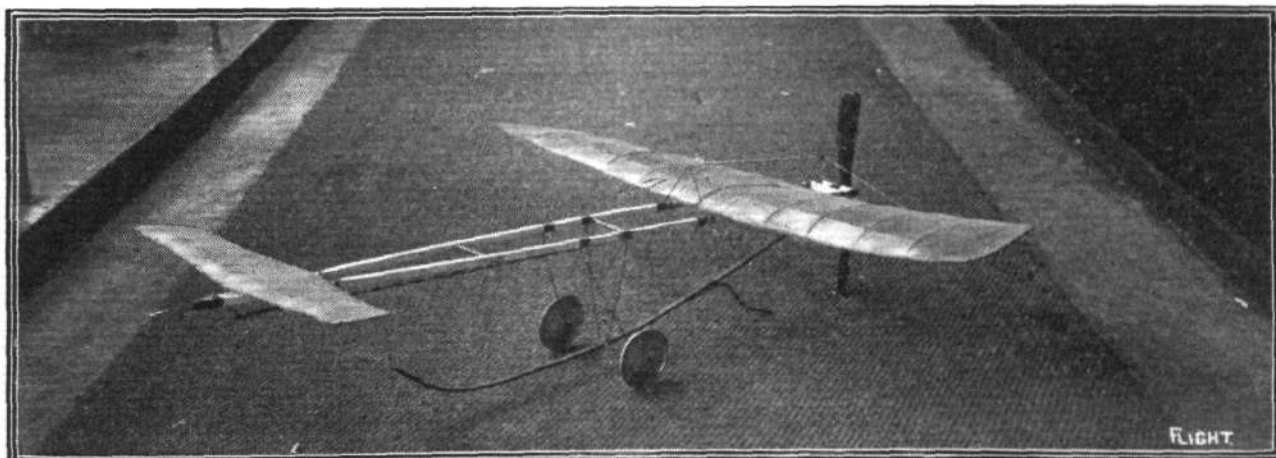
of the model to 22.25 lbs., thereby again making it too heavy. I made several other models, including a 16 ft. span monoplane, but met with no success owing to the weight. Last year I purchased a twin cylinder engine which is supposed to be 1 h.p., but I think it is not more than .6 h.p.; the weight complete with ignition, &c., was 10.5 lbs., with a 26 in. diameter propeller which gave 3 to 3.75 thrust. I made a biplane 8 ft. span and 15 in. chord, the weight being 19.5 lbs., the weight again being too much. I then made a few propellers, each having a diameter of 30 ins. and various pitches. The best result was obtained from one having a 17 in. pitch, the thrust being 4.5 lbs. I then made another model (see photo.), span of top plane 10 ft. 6 ins., bottom plane 9 ft., chord 18 ins., and gap 20 ins., weight complete 19.5 lbs., which was too heavy, so I took the flywheel off the engine, thus reducing the weight to 17 lbs. I then made several trials. The models seemed to jump 3 ft. off the ground after a run of about 40 yds., and then land with the back skids touching the ground first. The next time I tried it with less angle of incidence; this gave better results, the flight being 30 to 60 yds. in length and the height 5 to 8 ft., the model still landing flat.

"The speed of the model whilst running on the ground was 16 to 17 m.p.h., but after rising the speed was greatly reduced. I found this out one day when the model was running towards a sharp incline about 14 ft. high, and I ran as fast as I could to catch it before reaching the incline; but the machine was gaining on me at every stride until it rose from the ground, then I began to gain upon the machine."

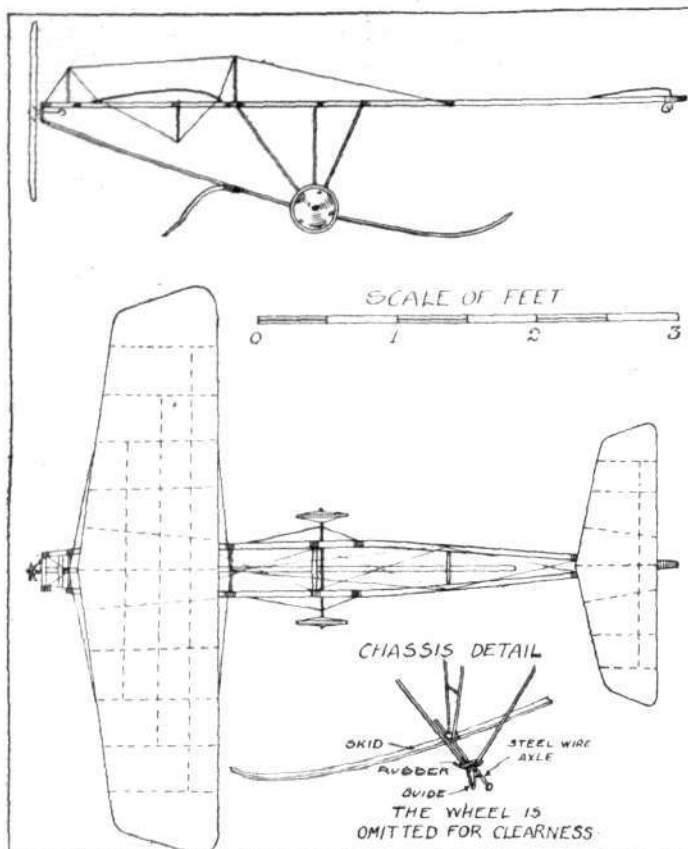
(To be continued.)

Mr. P. G. Cox's Olympia Model.

The fuselage is constructed of two pieces of poplar 4.5 ft. in length, and .5 inch square section, set 4.75 ins. apart near the leading edge of the main plane, tapering back to 4 ins. near the propeller and to a point at the front. The cross spars are 4 in number of streamline section, and are placed 12 ins. apart, starting from the rear of the two longitudinals. An extra strong piece being put in at this end to take the bearing bracket of the propeller. The landing chassis is built up of 18 gauge piano wire, with an ash skid 1/2 in. by 3/8, running 3 ft. 6 ins. from the rear of the fuselage, and bent up at the front as shown in the photograph. The wheel axle is made of 14 gauge steel spring wire, and is firmly fixed to the ash skid, but the wire and rubber in the vicinity of the wheels are constructed so as to take all the shock when landing, as



Mr. P. G. Cox's weight-lifting Olympia model.



Mr. P. G. Cox's Weight-Lifting Olympia Model.—Plan and side elevation to scale.

shown in the sketch. The disc wheels are 4 ins. in diameter. The planes were built up of 16 and 18 gauge piano wire covered with proofed silk. The span of the main plane is 4 ft., the chord at the centre 12 ins., tapering to 9 ins. at the tips; the camber, 1 in. in the centre, washing out to nothing at the tips. The main plain is given a slight dihedral angle, and 4 wire strainers fixed to wire cabanes above and 2 beneath make this easily adjustable.

The elevator has a span of 2 ft., the chord in the centre is 7 ins., tapering to 5 ins. at the tips; these latter are slightly upturned. The camber in the centre is $\frac{1}{2}$ in., running out to nothing at the ends. The elevator is screw adjusted.

The propeller has a diameter of 16 ins. and a pitch of 18 ins. It is mounted on a ball thrust bearing, obtained from Messrs. T. W. K. Clarke and Co., which runs very smoothly; no gears are used.

The motive power is composed of 24 strands of $\frac{1}{4}$ in. strip rubber. All the wood used in the above model was supplied by Messrs. W. G. Evans and Sons.

The total weight of the machine, unloaded, is 1 lb. 11 ozs. Unloaded the model has made a flight of 25 secs. The model contains many interesting constructional features apart from its unusually heavy weight, which handicapped it very much in the flying competitions at Hendon.

KITE AND MODEL AEROPLANE ASSOCIATION. Official Notices.

Competitions.—The second annual competition for the E. C. Trollope Cup for teams of two kites with a minimum total of 80 ft. took place on August 22nd, on Wimbledon Common, and attracted an entry of 10, which was the same as last year. The following were the results of the first three:—

Place.	Competitor.	Make.	Marks.				Total.
			Angle.	Stability.	Strength.	Portability.	
1	L. Ingram, Wimbledon ..	Double Box ...	86	115	80	50	331
2	W. Collins, Croydon ...	Box and wing ...	90	110	75	50	325
3	G. T. White, Brockley ...	White patent ...	54	80	75	50	259

The holder, G. T. White, had bad luck, and was only able to secure third place. A. W. Brown, of Croydon, again this year had the misfortune of breaking away almost on the call of time, which disqualified him, otherwise he was flying grandly. H. Stewart, of Clapham, also broke away. The winner is one of the associate fellows of the Association, and his kites were splendidly made in every respect, and in the opinion of the judges were the strongest made, being of Pegamoid aero fabric. He won the gold medal presented by Mr. E. C. Trollope,

and holds the cup (presented by the late Col. F. C. Trollope) for one year from date of prize distribution; Messrs. Collins and White taking respectively the silver and bronze medals presented by Mr. E. C. Trollope.

Women's Aerial League Kite Contest for Ladies.—This competition was held after the Trollope contest, and the judges were Messrs. F. Presiguer and G. T. White. The results of the first four were as follows:—

		Marks.			
Place.	Name.	Angle.	Stability.	Strength.	Total.
1	Miss Irene Akehurst ...	51	100	100	251
2	Mrs. L. Ingram ...	44	100	100	244
3	Miss F. Gregg ...	48	97	95	242
4	Mrs. W. H. Akehurst ...	45	100	97	240

Miss Akehurst won the handsome case containing silver back brush, mirror and comb; Mrs. Ingram the case of six teaspoons and tongs, and Miss Gregg biscuit box. All the prizes presented by the Women's Patriotic Aerial League.

Model Competitions.—To be held on Wanstead Flats, Leytonstone, Sept. 12th, at 3 o'clock. Entries close Sept. 5th. Longest flight and general stability competition for single-screw models rising off the ground (open to the world). Prizes: 1st, the Association's silver challenge cup and gold medal; 2nd, silver medal; 3rd, bronze medal. Tests: Distance; stability. Marks: Distance, actual yards; stability, 25. Additional rules governing this competition:—1. Competitors must submit enclosed body models either of the canard or tractor type, ratio of width to length of body not to exceed 12. 2. Models must not weigh less than 4 ozs. 3. Competitors must be at the judges' flag at 2.45. Those not present at that time will be disqualified. 4. Stability, both longitudinal and lateral, will be noted by the judges and taken into consideration in their award. 5. Minimum loading biplanes 3 ozs. per square foot; monoplanes 4 ozs. per square foot.

27, Victory Road, Wimbledon. W. H. AKEHURST, Gen. Hon. Sec.

AFFILIATED MODEL CLUBS DIARY.

Club reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Leytonstone and District Ae.C. (14, LEYTONSTONE RD., STRATFORD)

AUG. 30TH.—Flying as usual, 6.30 and 10. Competition for A Section. Farrow Shield models. 3 silver medals. All communications should be addressed to new Hon. Sec., Mr. L. Lamplugh, 14, Leytonstone Road, Stratford.

Sheffield Ae.C. (41, CONISTON ROAD, ABBEYDALE, SHEFFIELD).

SEPT. 5TH, 3.30, at Standhouse Aerodrome Intake, Competition for built-up fuselages applicable to full-size machines, any weight or size, but fuselage must not be less than 2 ins. in diameter. Machines to be twin-propeller biplanes, 0-2-1 type, r.o.g.

UNAFFILIATED CLUBS.

Hove Aero Club (4, BROOKER STREET, HOVE).

AUG. 29TH, 1st Hydro. Meet, distance-duration. Sept. 5th, weight-carrying contest.

CORRESPONDENCE.

The War and French Patents.

[1884] My Parisian agent, writing on the 19th inst., informs me that by a decree given on the 16th inst. the French Government, with commendable thoughtfulness for inventors, will allow applications for patents to be made without payment of the usual application fee of 100 francs. Such payment is only to be made after the war and on a date to be subsequently fixed.

The decree applies to British applicants and, presumably, to all others except subjects of those countries at war with France.

WILLIAM H. TAYLOR.

3, Brown Street, Market Street, Manchester.

August 24th.

Recruits Wanted for Royal Naval Air Service.

It will be seen from an announcement in our advertisement columns that certain classes of tradesmen are wanted for the Royal Naval Air Service. Those qualified should apply in writing to Squadron-Commander G. W. S. Aldwell, R.N., Aircraft Co.'s Works, Annesdale Avenue, Hendon, N.W.

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